



Concrete Solutions That Go Beyond The Surface.

CSI Specifications

SECTION 03300 - CAST-IN-PLACE CONCRETE

SECTION 03400 - PRECAST CONCRETE

Cresset Chemical Company's non-proprietary 3-Part CSI Specification for producing architectural grade concrete surfaces (Version 2.1)

NOTES TO SPECIFIER

Use non-proprietary Cresset Concrete Standards (CCS) to create understanding among owners, architects/engineers and contractors for the appearance of concrete surfaces...before you pour. CCS helps you specify the appearance of formed concrete surfaces and limit the number and size of bugholes and other surface defects. This Guide Specification is for CCS-1, CCS-2, and CCS-3 which promotes consistent visual standards for Architectural Grade concrete surfaces.

Use CCS in a non-proprietary performance specification or to specify Crete-Lease Release Agents by Cresset Chemical Company. Crete-Lease Release Agents help make it possible to remove forms from hardened concrete and produce high visual impact concrete surfaces. They provide consistent CCS results, are very economical to use, and comply with environmental and OSHA requirements.

Insert text from Guide Specification into a complete master specification for concrete, then edit to meet Project requirements.

PART 1 GENERAL

1.01 RELATED SECTIONS

When properly applied, Crete-Lease Release Agents do not interfere with adhesion of conventional coatings, paints, sealants, adhesives, or other related work.

1.02 REFERENCES

- A. American Concrete Institute:
 1. ACI 301 - Specifications for Structural Concrete for Buildings.
 2. ACI 303 - Guide to Cast-in-Place Architectural Concrete Practice.
 3. ACI 533 - Guide for Precast Concrete Wall Panels
- B. Cresset Concrete Standards (CCS): Published by Cresset Chemical Company, One Cresset Center, Box 367, Weston, OH 43569; Fax: 419-669-2200; Phone: 800-367-2020; <http://www.cresset.com>, e-mail: cresset@cresset.com.
- C. Precast/Prestressed Concrete Institute (PCI): PCI MNL 117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.

1.03 SUBMITTALS

Unfortunately, Material Safety Data Sheets (MSDS's) are a potential minefield of misinformation. Read them with objective caution. Compare flash points and VOC data in Specification Sheets and MSDS's...ideally, they should agree. When you find estimated or conflicting data, keep in mind that flash points and/or VOC's are among the primary red flags checked by OSHA, EPA and DOT. OSHA defines flammable as a flash point below 100°F (38°C); DOT defines flammable as a flash point below 141°F (61°C) or, under certain circumstances, below 100°F (38°C); and EPA defines ignitability (which makes material a hazardous waste) as a flash point below 141°F (61°C). The lowest flash point of a chemical in a mixture determines the flash point of the whole mixture.

- A. Product Data: Submit manufacturer's product data, installation (application) instructions and Material Safety Data Sheet for release agents.

Retain following for precast/prestressed concrete.

- B. Shop Drawings: Indicate surfaces to receive Architectural Grade specifications.
- C. References: Submit copies of Cresset Concrete Standards.

Retain following if contractor qualifications are specified.

- D. Qualifications: Submit [resume of installer's qualifications] [and] [copy of producer's certification].

1.04 DELIVERY, STORAGE, AND HANDLING

Most Cresset release agents are not sensitive to typical storage temperatures. However Crete-Lease 20-VOC-Xtra Release Agent is a water-based product and must be protected from temperatures below 35°F and above 100°F. Storing drums horizontally helps prevent moisture from being drawn into drum as it expands and contracts due to temperature changes.

OSHA and DOT regulations require distributors and contractors to have periodic training for all hazardous materials. Cresset's Crete-Lease release agents are not DOT hazardous, which helps avoid potential HAZMAT/DOT compliance complications.



Concrete Solutions That Go Beyond The Surface.

- A. Release Agents: Deliver in original, sealed containers. Prevent water or ice from collecting on drum tops; if outside, store drums horizontally. [Store water-based release agents at 35°F to 100°F (2°C to 38°C).]

1.05 QUALITY ASSURANCE

- A. [Cast-in-Place Concrete: Comply with ACI 301 and ACI 303 except where otherwise indicated.]
B. [Precast Concrete: Comply with ACI 301, ACI 533, and PCI MNL 117] except where otherwise indicated.]
C. Installer's Qualifications: Installer shall have [5] [] years experience installing concrete with Architectural Grade surfaces equivalent to those required on this Project.

Qualified architectural concrete contractors and precast producers should have no difficulty obtaining Architectural Grade surfaces using Cresset Concrete Standards. However, when CCS-1 or CCS-2 is required, consider additional qualifications; use A and C (above) for cast-in-place work and B and D (below) for precast work.

- D. Certification: Precast producer shall be certified by [Precast/Prestressed Concrete Institute] [National Precast Concrete Association].

Crete-Lease Release Agents have demonstrated their ability to help achieve consistent CCS appearance levels. While a properly installed (applied) release agent is necessary to create Architectural Grade surfaces, the concrete materials, workmanship, and other conditions on a Project also affect results. Mock-ups help establish specific appearance performance criteria for a Project.

E. Mock-Up:

1. Construct [wall] [] not less than [4 x 4 feet (1.5 x 1.5 m) [] at location selected by [Architect] []. Use materials and workmanship proposed for Architectural Grade surfaces.
2. Accepted mock-up establishes a range of acceptable visual performance for Architectural Grade concrete.
3. At conclusion of Work, mock-up [shall be removed from Site.] [may remain as part of Work.]

- D. Pre-Installation Conference: Conduct conference to review scheduling and methods employed to assure quality of Architectural Grade concrete. Discuss coordination of release agent application, formwork and steel erection, inspection, placing of concrete, protection of forms and protection of hardened concrete to avoid contamination of release agent and damaging hardened concrete.

PART 2 PRODUCTS

2.01 FORMWORK MATERIALS

For CCS-1 or CCS-2 Architectural Grade surfaces, form surface must be non-porous material such as exterior grade plywood coated with 5 layers of epoxy or urethane paint, HDO plywood, steel, fiberglass, most plastic coverings and formliners; do not use B-B plywood or aluminum. For CCS-3 Architectural Grade surfaces, aluminum forms can also be used. If applicable, specify materials for rustication or reveal strips, and tape or caulk for joints between formwork sections.

2.02 RELEASE AGENT

A. Acceptable Manufacturer:

1. Crete-Lease Release Agents manufactured by Cresset Chemical Company; One Cresset Center, Box 367, Weston, OH 43569; fax 419-669-2200; phone 800-367-2020 (<http://www.cresset.com>, e-mail: cresset@cresset.com).

2. Substitutions: Submit substitution requests in accordance with [Instructions to Bidders] [Division One requirements]. Include installation instructions and test reports documenting that proposed release agent can provide Architectural Grade surface.

Select one product from list below, or allow Contractor option of selecting which Crete-Lease product to use. It is usually easier and more economical to use the same Crete-Lease Release Agent throughout an entire project rather than have two or more on hand.

The following products are compatible with conventional concrete materials and admixtures and with forms made using plywood (exterior grade, B-B, pre-oiled, HDO, MDO and LDO), ABS, PVC, fiberglass reinforced plastic, coatings (epoxy, urethane, and silicone), steel, aluminum, and wood. Note that compatibility with all of these form systems does not mean that all of these systems help produce CCS-1 or CCS-2 surfaces (see Formwork Materials above). In addition:

** Crete-Lease 727-Xtra Release Agent is oil-based and can be used for CCS-2 and CCS-3 surfaces.*

** Crete-Lease 880-VOC-Xtra Release Agent is oil-based and can be used for CCS-1, CCS-2 and CCS-3 surfaces.*

** Crete-Lease 20-VOC-Xtra Release Agent is water-based (an emulsion) and can be used for CCS-1, CCS-2 and CCS-3 surfaces. It produces these good looking surfaces despite overapplication, and it is compatible with extruded or expanded polystyrene foam and natural rubber latex form liners. It is water-based, biodegradable, non-flammable and non-combustible and it cannot be applied to forms at temperatures below freezing.*



Concrete Solutions That Go Beyond The Surface.

See Cresset product literature for additional information.

B. Product:

1. Release agent shall be capable of releasing forms from hardened concrete without staining concrete or forming bugholes and other surface defects in excess of specified Architectural Grade surface, compatible with concrete and form materials, non-toxic, and in compliance with applicable VOC and other environmental standards. Release agent shall react chemically with concrete surface to facilitate release. Products containing diesel oil are not acceptable.
2. Provide Crete-Lease [20-VOC,] [727,] [or] [880-VOC] Release Agent [as selected by Contractor in accordance with manufacturer's recommendations for conditions of use].

Flat spray tips produce droplets 75% smaller than ordinary cone spray tips and make it easier to apply ultra-thin films of release agent required for Architectural Grade surfaces. Sprayers designed for applying concrete curing compounds apply ten times too much release agent and should not be permitted for producing high visual impact surfaces.

- C. Application Equipment:** For Architectural Grade surface, use spray equipment complying with release agent manufacturer's instructions and spray tips that produce flat spray pattern.

PART 3 EXECUTION

Cast-in-Place Concrete: The following guidelines will help you achieve the desired Architectural Grade surfaces:

1. *Install forms for sides of walls not receiving Architectural Grade surface first. After reinforcing steel, etc. is erected, then install architectural grade formwork.*
2. *Form joints shall be water tight. Joints can be sealed with tape or with caulk. Consider using rustication or reveal strips to hide form ties and taped joints between sections of forms.*
3. *Apply form release as specified below.*
4. *If a CCS-1 or CCS-2 surface is required, cover treated forms with plastic sheets to protect from precipitation, dust, and debris.*
5. *If architectural grade formwork must be installed first, then protect treated side (with plastic sheets) so that the process of erecting the reinforcing steel does not damage the treated surfaces.*
6. *After reinforcing steel, etc. is erected, apply release agent to forms for opposite (architectural grade) side of wall before installing form sections into wall. Handle sections in such a way as to minimize contamination of form release.*
7. *If additional form release has to be installed after forms are in place, avoid overspraying form release onto reinforcement.*
8. *Remove plastic sheet from Architectural Grade face, and apply protection to top of forms until ready to place concrete.*
9. *Specify patching of form-tie holes and removal of fins caused by improperly sealed form joints consistent with desired Architectural Grade surfaces.*

Precast Concrete: At Specifier's option, application of release agent can be moved to Part 2 and included in Fabrication.

3.01 RELEASE AGENT

Applying an ultra-thin film of Crete-Lease Release Agent is essential to creating a concrete surface free of excessive bug holes and other defects. For best surface appearance, (CCS-1), wipe off excess release agent with clean, soft flannel cloth that is moist (not wet) with release agent. Spraying ultra thin films yields coverage rates up to 2,000 sq ft/gallon (49 sq m/l) making Cresset Release Agents very economical to use.

The film thicknesses specified below are based on the performance of Cresset Crete-Lease Release Agents and may not apply to products by other manufacturers.

A. Architectural Grade Surface:

1. **Form Preparation:** Form surfaces shall be clean and dry. Remove traces of concrete build-up from form surfaces before applying release agent.
2. **Spray apply** continuous uniform film free from runs.
3. **Appearance:** Comply with CCS to provide:



Concrete Solutions That Go Beyond The Surface.

- a. [CCS-1: Apply film thickness less than 0.0005 inch. (0.013 mm).
Wipe off excess release agent with clean, soft flannel cloth moistened (not wet) with release agent.]
 - b. [CCS-2: Apply 0.0005 to 0.0010 inch (0.013 to 0.025 mm) film thickness.]
 - c. [CCS-3: Apply 0.0010 to 0.0025 inch (0.025 to 0.064 mm) film thickness.]
4. Avoid overspray on reinforcing materials. Remove overspray on reinforcing materials within 24 hours using degreasing solvent recommended by release agent manufacturer.
 5. Do not apply more than 14 days before placing concrete. [Do not apply water-based release agents when ambient or material temperatures are below freezing.]
 6. Touch up forms, if necessary, using clean, soft flannel cloth moistened (not wet) with release agent.
 7. Protect treated forms from dust, debris and precipitation. Before placing concrete, inspect in-place, erected and treated forms; remove contamination and touch-up forms as required.

B. [Utility Grade] [and] [Concealed] Surfaces: Apply release agent in accordance with manufacturer's instructions to provide CCS-5 or better appearance.

Include the following list if the scope or location of different kinds of concrete surfaces is not shown elsewhere in Contract Documents.

C. Schedule of Concrete Surfaces:

1. Architectural Grade: [Exposed to view concrete surfaces] [and] [_____] [unless otherwise indicated].
2. Utility Grade: [Mechanical and equipment rooms,] [closets,] [storage rooms,] [shafts and utility tunnels,] [and] [_____] Concealed Surfaces: Surfaces concealed from view by other work [and] [_____].

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