

**U.S. General Services Administration
Inflation Reduction Act
Low Embodied Carbon Concrete Requirements**

December 12, 2023

Preface

The Inflation Reduction Act of 2022 (IRA), Pub. L. No. 117-169, was enacted in August 2022. The IRA made the single largest investment in climate and energy in American history. The IRA will help the United States tackle the climate crisis, advance environmental justice, and secure our Nation's position as a world leader in domestic clean energy manufacturing. This law puts the United States on a pathway to achieving the Administration's climate goals, including a net zero operational emissions federal building portfolio by 2045, and net zero emissions procurement by 2050. IRA Section 60503 provides the U.S. General Services Administration (GSA) with \$2.15 billion for acquisition and installation of construction materials and products with substantially lower levels of embodied greenhouse gas emissions as compared to estimated industry averages, as determined by the Administrator of the U.S. Environmental Protection Agency (EPA). EPA issued its [Interim Determination](#) in December 2022.

In line with the Interim Determination, and consistent with standard GSA and Federal Acquisition Regulation processes for defining agency requirements, GSA has developed these IRA Low Embodied Carbon Concrete Requirements to specify some material attributes that are necessary to satisfy the agency's concrete, cement and concrete masonry unit needs when contracting for construction services that are funded in whole or in part by GSA's IRA Low Embodied Carbon appropriation. These IRA Low Embodied Carbon Concrete Requirements apply to Section 60503-funded purchases of concrete, cement and concrete masonry units; construction product assemblies (such as rebar-reinforced concrete) qualify for IRA funding if at least 80% of the assembly's total cost or total weight comprises concrete materials that meet these Requirements. These IRA Low Embodied Carbon Concrete Requirements do not apply to all procurements and only apply after a contracting officer exercises their discretion to incorporate IRA Section 60503-qualifying concrete, cement or concrete masonry units into a procurement contract. Additionally, these IRA LEC Concrete Requirements do not supersede existing laws such as the Buy American Act of 1933 or the Trade Agreements Act of 1979. All concrete, cement and concrete masonry units procured for GSA projects must meet these laws. For IRA Section 60503-funded procurements, existing trade-related laws will be applied first, then GSA's IRA LEC Concrete Requirements will be applied.

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Concrete

● **Material Type**

- Concrete is a composite material consisting of a mixture of hydraulic “e.g. portland” cement, aggregates, and water, with or without admixtures, fibers, or other cementitious materials.
 - Concrete can be mixed at a job site, or “ready mixed” and batched for delivery from a central plant. Its wide-ranging applications include foundations, floors, walls, and roadways.
- Construction product assemblies (such as rebar-reinforced concrete, or concrete made with qualifying cement) qualify for IRA funding if at least 80% of the assembly’s total cost or total weight comprises materials that meet these Requirements.
 - Where provision of concrete that qualifies under these GSA IRA Limits is impractical, GSA’s IRA Limits for cement may be applied to the cement being used in the concrete mix.

● **GSA IRA LEC Material Requirements**

	GSA IRA Limits for Low Embodied Carbon Concrete (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per cubic meter - kgCO ₂ e/ m ³)		
Specified concrete strength class (compressive strength [f’c] in pounds per square inch [PSI])	Top 20% Limit	Top 40% Limit	Better Than Average Limit
≤2499	228	261	277
3000	257	291	318
4000	284	326	352
5000	305	357	382
6000	319	374	407
≥7200	321	362	402
Add 30% to these numbers for GWP limits where high early strength ¹ concrete mixes are required for technical reasons.			

● **Compliance Documentation**

- A product-specific Type III (third-party verified) Environmental Product Declaration (EPD) that:
 - (i) is based on the PCR used to develop these limits: NSF International’s [Product Category Rule for Concrete](#) (8/2021, version 2.1); and (ii) conforms with ISO 14025 and ISO 21930.

¹ “High early strength” is concrete that, through the use of additional cement, high-early-strength cement, or admixtures, has accelerated early-age strength development. High early strength concrete produced using additional cement should be avoided where possible, due to its higher embodied carbon. An affected project delivery team must obtain written approval from GSA’s IRA PMO on whether high early strength concrete is necessary for technical reasons. This 30% allowance reflects input from building sustainability experts, general contractors, engineers, and ready-mix or cement producers.

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- Where feasible, EPDs must also rely on facility-specific data, including for the supply chain's associated unit processes, such as concrete's upstream cement plant, rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.
- ENERGY STAR [Energy Performance Score for the supplying cement plant](#), the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see "ENERGY STAR Energy Performance Score Explained" at bottom for more information.

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Cement

● **Material Type**

- Cement is the basic ingredient of concrete. Cement (including portland and portland-limestone cement) is manufactured through the chemical combination of ingredients including calcium, silicon, aluminum, and iron. When heated at high temperatures in kilns, some elements are driven off in the form of gases, while others unite to form a new substance called clinker. Clinker is cooled, ground, and mixed with small amounts of gypsum and limestone to make cement.
 - When cement creates a paste with water that binds with sand and rock “aggregates” to harden, it forms concrete. Cement is transported to ready-mix concrete companies to be used in concrete for a wide variety of construction purposes.

● **GSA IRA LEC Material Requirements**

- Where provision of concrete that qualifies under these GSA IRA Limits is practical, GSA’s IRA Limits for Low Embodied Concrete must be used.
- Where provision of concrete that qualifies under these GSA IRA Limits is impractical, GSA’s IRA Limits for cement may be applied to the cement being used in the concrete mix.
 - A concrete EPD accounts for the whole mix design, including quantitative impacts of specific cements, aggregates, and admixtures.
 - If a concrete EPD is provided to demonstrate compliance, a cement EPD doesn’t need to be submitted to GSA. Cement is an input to concrete mixes, and its GWP is accounted for in the concrete EPD.
 - Construction product assemblies can also qualify for IRA funding where at least 80% of the assembly’s total cost or total weight comprises IRA-qualifying material such as low embodied carbon cement.

GSA IRA Limits for Low Embodied Carbon Cement (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per metric ton - kgCO _{2e} / t)		
Top 20% Limit	Top 40% Limit	Better Than Average Limit
751	819	858

● **Compliance Documentation**

- A product-specific Type III (third-party verified) Environmental Product Declaration (EPD) that:
 - (i) is based on the PCR used to develop these limits: NSF International’s [Product Category Rule for Portland, Blended, Masonry, Mortar, and Plastic \(Stucco\) Cements](#) (9/2021, version 3.2; or 5/2020, version 3.0); and (ii) conforms with ISO 14025 and ISO 21930.
 - Where feasible, EPDs must also rely on facility-specific data, including for the supply chain’s associated unit processes, rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material’s most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.
- ENERGY STAR [Energy Performance Score for the concrete’s supplying cement plant](#), the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see “ENERGY STAR Energy Performance Score Explained” at bottom for more information.

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Concrete Masonry Units

- **Material Type**

- Concrete masonry units (CMUs) are standard-sized rectangular blocks used in building construction, sometimes referred to as cinder blocks.
 - Other types of manufactured concrete can include concrete brick, concrete pavers and slabs, segmental concrete retaining walls, manufactured veneer stone, and concrete roof tiles.

- **GSA IRA LEC Material Requirements**

GSA IRA Limits for Low Embodied Carbon Concrete Masonry Units (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per cubic meter - kgCO ₂ e/ m ³)		
Top 20% Limit	Top 40% Limit	Better Than Average Limit
217	256	290

- **Compliance Documentation**

- A product-specific Type III (third-party verified) Environmental Product Declaration (EPD) that:
 - (i) is based on a PCR for the applicable product category that was active when the EPD was issued, and which was used to develop these limits: [ASTM International's PCR for Precast Concrete](#) (5/2021, version 3.0) or [UL's Part B: Concrete Masonry and Segmental Concrete Paving Product EPD Requirements](#) (3/2022, version 1.1); and (ii) conforms with ISO 14025 and ISO 21930.
 - Where feasible, EPDs must also rely on facility-specific data, including for the supply chain's associated unit processes, such as concrete's upstream cement plant, rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.
- ENERGY STAR [Energy Performance Score for the CMUs' supplying cement plant](#), the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see "ENERGY STAR Energy Performance Score Explained" at bottom for more information.

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ENERGY STAR Energy Performance Score Explained

ENERGY STAR Energy Performance Scores (EPS) show how efficiently a manufacturing plant uses energy on a 100-point scale. A score of 50 reflects average performance, 1 shows poor performance, and 100 reflects highest performance.

Contractors obtain Energy Performance Scores by requesting producers of cement (including cement used in concrete or concrete masonry units) to provide the score. Or, contractors may request it from material suppliers (e.g. concrete producers).

Manufacturers of cement produce a plant's score by inputting 12 months of energy and production data in the industry-specific Energy Performance Indicator (EPI) tool available at www.energystar.gov/epis. The score will show on the Statement of Energy Performance section of the EPI.

Energy Performance Scores can currently be produced for cement.