

Industry Assessment

Technical Brief

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Office of the
Assistant Secretary
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Review of National and State Policies on Slag in Concrete

Overview

This technical brief reviews national and state policy frameworks affecting the use of slag materials in concrete. Existing policies address slag through environmental¹ regulation, beneficial-use programs, transportation requirements, and construction approval processes, but these pathways vary by material, application, and jurisdiction. While slag cement has a comparatively established pathway for concrete use, steel slag is more commonly addressed through policies developed for aggregate, road base, fill, and other applications. The central policy gap is that approval for one application does not establish a clear pathway for evaluation and acceptance in another. Terminology and classification differences can further complicate how policies and approvals are applied across slag types and applications. Although federal regulations provide broad principles for material classification and beneficial use, decisions on permitted applications, acceptance, and oversight are largely made at the state level. Therefore, greater alignment among these policy pathways is needed to provide a clearer basis for evaluating steel slag proposed for concrete applications.

Key Takeaways

- Steel slag does not have a uniform policy pathway for concrete use across jurisdictions.
- Existing steel-slag policies are predominantly associated with aggregate, road base, fill, and other established applications, rather than its use as a concrete constituent.
- State policies differ in permitted applications, evaluation requirements, documentation, and conditions of use, resulting in different approval pathways across jurisdictions.
- Clearer alignment among environmental¹ evaluation, transportation requirements, material performance, and construction approval is needed for steel slag proposed for concrete applications.

¹ For the purposes of this brief, “environmental” solely refers to considerations associated with the potential leaching or release of metals and other regulated constituents from slag materials under applicable use conditions.

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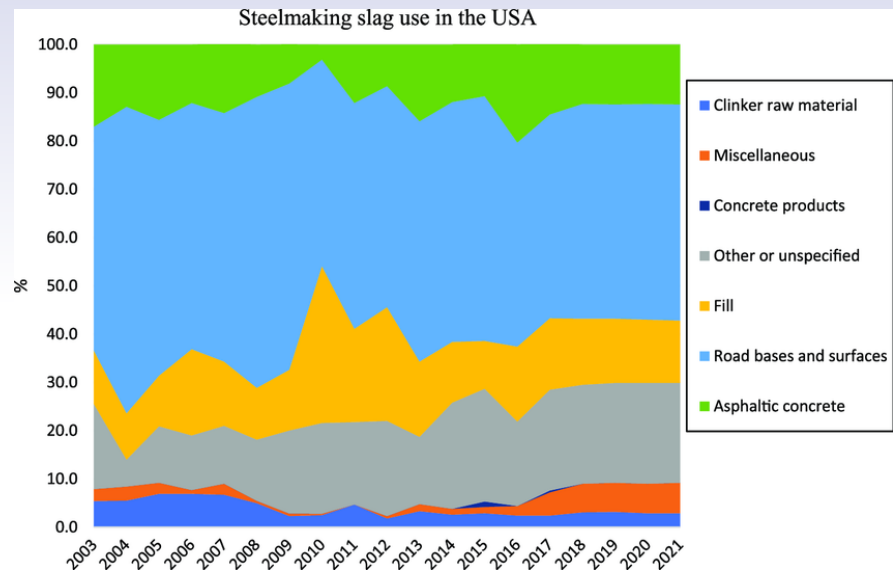
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United States Department of Transportation Research Initiative on the Use of Steel Slag in Concrete and Cement

Regional Distribution and End-Use Patterns of Use of Slag Materials



Source: Kurecki M., (2024), steel research international 96(8)

Reported U.S. steel-slag use data from 2003 through 2021 show that road bases and surfaces, asphaltic concrete, and fill accounted for approximately 70-86% of reported use, while concrete products represented a comparatively small share. The concrete-products category does not distinguish between steel slag used as aggregate and finely ground material used as an SCM. These data illustrate the limited reported use of steel slag in concrete products and the difficulty of distinguishing material form and function within existing end-use classifications.

Major Gaps Affecting Slag Uses

Terminology, material
diversity, and evaluation

- Broad terminology and policy classifications may encompass slag materials with different sources, processing, properties, and stability.
- Evaluation requirements may therefore depend on the specific material and proposed use.

Fragmented policy and
regulatory framework

- Guidance is distributed across multiple agencies and policy programs developed for different purposes.
- No single framework connects regulatory status through construction acceptance.

Inconsistent classification
and acceptance

- Regulatory or beneficial-use classification does not necessarily establish construction acceptance.
- Status may differ by material form and intended application.

Unclear application and
approval pathways

- Existing policies primarily address established uses such as aggregate, base, fill, with limited provisions for steel slag used for concrete.
- New applications may require project- or application-specific approval.

Separate evaluation and
approval processes

- Environmental, transportation, and construction reviews may apply different requirements.
- Approval under one pathway does not establish acceptance under another.

State-level variability in
permitted use and
oversight

- Permitted uses, conditions, documentation, and oversight vary among states.

Source: Based on review of national guidance and State DOT policy documents

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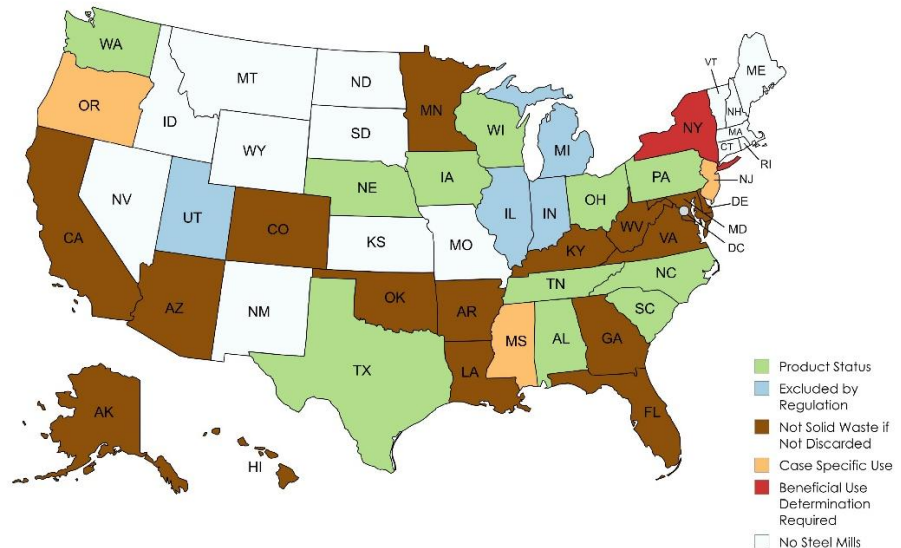
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Together, these gaps show that steel slag may encounter different classification, environmental¹ evaluation, and approval requirements depending on the material, proposed application, and jurisdiction. Existing policies developed for established slag uses may therefore provide limited direction when steel slag is proposed for concrete applications.

Implementation and Regulatory Challenges Influencing Policy Treatment of Iron and Steel Slag



Source: A Review on the Current State of the Iron and Steel Slag Industry (2022) (National Slag association)

Key challenges influencing the use of these slags include perception-related barriers, regulatory scrutiny, and state-specific concerns. Environmental¹, transportation, and construction policies were developed for different purposes and may classify steel slag independently. Despite product classifications and recognized beneficial uses, technical and environmental¹ concerns continue to shape policy treatment and practical acceptance. Examples below show how concerns related to leachate behavior, nuisance dust, and potential human health impacts have shaped regulatory responses and acceptance conditions in different states.

State	Primary documented concern	Policy / regulatory implication
Indiana	Leachate behavior associated with BFS use in road construction	Emphasizes need for leaching evaluation, predictive assessment methods, and standardized environmental performance testing
Iowa	Dust generation and exposure concerns related to slag use on unpaved roads	Relates to particle stability, abrasion resistance, fines generation, and durability related material testing
Colorado	Environmental and chemical risk concerns, including oxidation potential	Highlights relevance of leaching tests, chemical stability evaluation, weathering resistance, and long-term durability assessment

Source: A Review on the Current State of the Iron and Steel Slag Industry (2022) (NSA)

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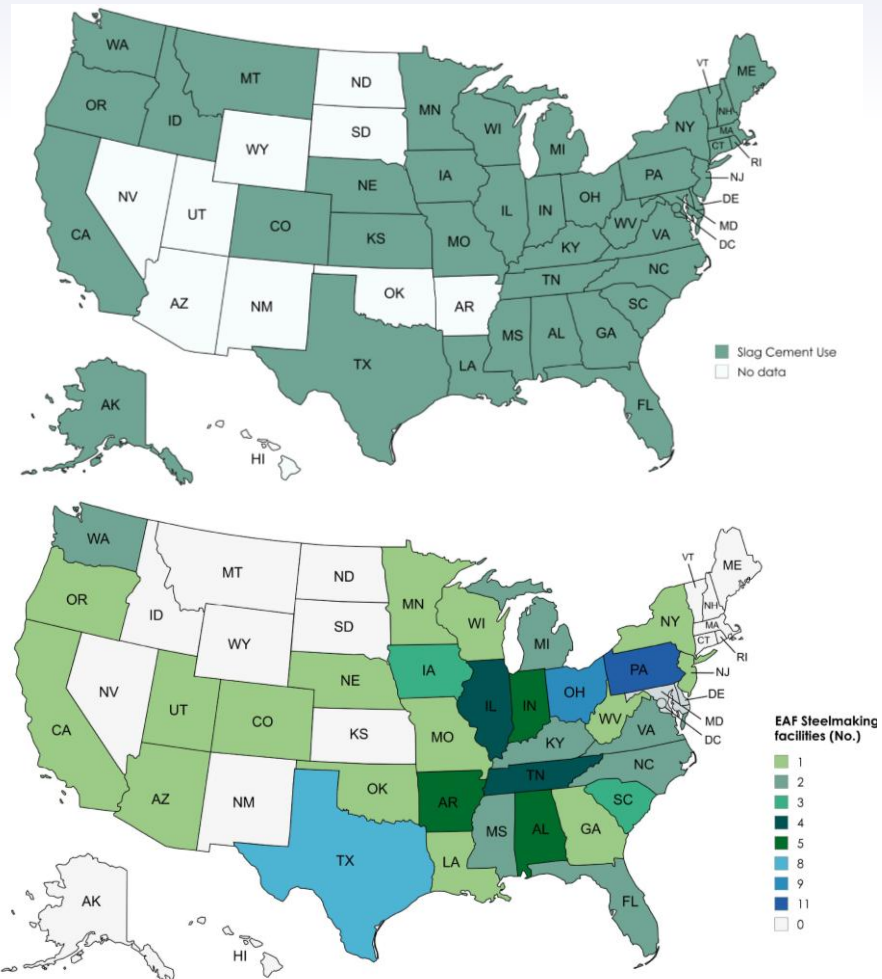
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Existing regulatory and beneficial-use classifications provide different starting points, but they do not necessarily establish whether SCM use is covered or whether an additional determination is required. Producers and users may therefore face separate reviews, repeated documentation, and uncertain approval requirements.



Source: Slag Cement Association (2018); U.S. Geological Survey (USGS); National Academies of Sciences, Engineering, and Medicine (2022).

The maps illustrate the uneven distribution of slag production and established use across the United States. States with greater exposure to slag production and established applications may have greater familiarity with these materials, while states with less direct experience may apply more limited or application-specific approaches. The figures therefore reinforce that policy treatment can vary with regional production patterns, utilization history, and practical experience.

This brief summarizes findings on national and state policy treatment of slag materials in concrete applications as part of the Industry Assessment for USDOT-SLAG, “Research Initiative on the Use of Steel Slag in Concrete and Cement” under cooperative agreement 693JK42550005. Information supporting these findings can be found at: <https://cait.rutgers.edu/usdotsteelslag/publications/>. Inquiries about this work can be sent to: usdotsteelslaginitiative@rutgers.edu