

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1910

[Docket No. OSHA–2019–0001]

RIN 1218–AC93

Hazard Communication Standard

AGENCY: Occupational Safety and Health Administration (OSHA), Labor.

ACTION: Proposed rule; request for comments.

SUMMARY: OSHA is proposing through this notice of proposed rulemaking (NPRM) to modify the Hazard Communication Standard (HCS) to conform to the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Revision 7 (GHS, Rev. 7), to address issues that arose during the implementation of the 2012 update to the HCS, and provide better alignment with other U.S. agencies and international trading partners, without lowering overall protections of the standard. OSHA has preliminarily determined that the proposed revisions to the HCS will reduce costs and burdens while also improving the quality and consistency of information provided to employers and employees regarding chemical hazards and associated protective measures. Consistent with the Executive order entitled "Improving Regulation and Regulatory Review" (January 18, 2011) and section 3(a) of the Regulatory Flexibility Act, which call for assessment and, where appropriate, modification and improvement of existing rules to minimize any significant economic impact upon a substantial number of small entities, OSHA has reviewed the existing HCS. The agency has preliminarily determined that the proposed revisions will enhance the effectiveness of the HCS by ensuring employees are appropriately apprised of the chemical hazards to which they may be exposed, thus reducing the incidence of chemical-related occupational illnesses and injuries. The proposed modifications to the standard include revised criteria for classification of certain health and physical hazards, revised provisions for updating labels, new labeling provisions for small containers, technical amendments related to the contents of safety data sheets (SDSs), and related revisions to definitions of terms used in the standard.

DATES: Comments on this NPRM (including requests for hearing) and other information must be submitted by April 19, 2021.

Informal public hearing: OSHA will schedule an informal public hearing on the proposed rule if requested during the comment period. If a hearing is requested, the location and date of the hearing, procedures for interested parties to notify the agency of their intention to participate, and procedures for participants to submit their testimony and documentary evidence will be announced in the **Federal Register**.

ADDRESSES:

Written comments: You may submit comments and attachments, identified by Docket No. OSHA–2019–0001, electronically at <http://www.regulations.gov>, which is the Federal e-Rulemaking Portal. Follow the instructions online for making electronic submissions. After accessing "all documents and comments" in the docket (Docket No. OSHA–2019–0001), check the "proposed rule" box in the column headed "Document Type," find the document posted on the date of publication of this document, and click the "Comment Now" link. When uploading multiple attachments to www.regulations.gov, please number all of your attachments because www.regulations.gov will not automatically number the attachments. This will be very useful in identifying all attachments in the preamble. For example, Attachment 1—title of your document, Attachment 2—title of your document, Attachment 3—title of your document. For assistance with commenting and uploading documents, please see the Frequently Asked Questions on www.regulations.gov.

Instructions: All submissions must include the agency's name and the docket number for this rulemaking (Docket No. OSHA–2019–0001). All comments, including any personal information you provide, are placed in the public docket without change and may be made available online at <http://www.regulations.gov>. Therefore, OSHA cautions commenters about submitting information they do not want made available to the public, or submitting materials that contain personal information (either about themselves or others), such as Social Security Numbers and birthdates.

Docket: To read or download comments and materials submitted in response to this **Federal Register** document, go to Docket No. OSHA–2019–0001 at <http://www.regulations.gov>. All comments and

submissions are listed in the <http://www.regulations.gov> index; however, some information (e.g., copyrighted material) is not publicly available to read or download through that website. All comments and submissions, including copyrighted material, are available for inspection through the OSHA Docket Office.¹

FOR FURTHER INFORMATION CONTACT:

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I. Executive Summary

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) has been implemented around the world. In 2012, OSHA updated its Hazard Communication Standard (HCS), 29 CFR 1910.1200, to align with Revision 3 of the GHS (77 FR 17574).

¹ Documents submitted to the docket by OSHA or stakeholders are assigned document identification numbers (Document ID) for easy identification and retrieval. The full Document ID is the docket number plus a unique four-digit code. OSHA is identifying supporting information in this NPRM by author name, publication year, and the last four digits of the Document ID.

However, the GHS is updated with improvements and clarifications every two years. This proposed rulemaking would amend the HCS to align with Revision 7 of the GHS, published in 2017. OSHA is also proposing updates to address specific issues that have arisen since the 2012 rulemaking and to provide better alignment with international trading partners, without lowering the protections provided by the standard. This action is consistent with Executive Order 13563, “Improving Regulation and Regulatory Review” (January 18, 2011), and the Regulatory Flexibility Act, 5 U.S.C. 610, which requires periodic review of rules that may be out-of-date, ineffective, or excessively burdensome.

OSHA is required by the Occupational Safety and Health Act of 1970 (OSH Act) to assure, as far as possible, safe and healthful working conditions for the Nation’s working men and women. As part of this effort, OSHA first promulgated the HCS in 1983 to provide a standardized approach to workplace hazard communications associated with exposure to hazardous chemicals. The HCS requires chemical manufacturers or importers to classify the hazards of chemicals they produce or import. The standard requires all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, safety data sheets (SDSs), and

information and training. OSHA is not proposing to change the fundamental structure of the HCS.

OSHA has preliminarily determined that the proposed amendments to the HCS would enhance the effectiveness of the standard by ensuring that employees are appropriately apprised of the chemical hazards to which they may be exposed. The proposed modifications to the standard include revised criteria for classification of certain health and physical hazards to better capture and communicate the hazards to downstream users, revised provisions for labels (including proposed provisions addressing the labeling of small containers and the relabeling of chemicals that have been released for shipment), technical amendments related to the contents of SDSs, and new provisions relating to concentrations or concentration ranges being claimed as trade secrets.

Additionally, in accordance with all applicable Executive Orders, the Regulatory Flexibility Act, and the Unfunded Mandates Reform Act, OSHA has prepared a Preliminary Economic Analysis (PEA), including a Preliminary Regulatory Flexibility Analysis Certification, for the proposed modifications to the HCS (see the full PEA in Section VII of this document). Supporting materials prepared by OSHA, such as spreadsheets, are available in the public docket for this rulemaking, Docket ID OSHA–2019–0001, through www.regulations.gov.

OSHA invites comments on all aspects of the PEA.

In the PEA, OSHA estimates that the proposed rule would result in net cost savings of \$26.8 million per year at a 7 percent discount rate, as shown in Table ES–1, below (a summary of annualized costs by affected industry). Annualized at a 3 percent discount rate, OSHA estimates that the proposed rule would result in net cost savings of \$27.5 million per year. Under a perpetual time horizon to allow for cost comparisons under Executive Order 13771, OSHA estimates that the net cost savings of the proposed rule at a discount rate of 7 percent would be \$19.6 million per year in 2016 dollars.² OSHA also expects that the proposed revisions to the HCS would result in modest improvements in worker health and safety above those already being achieved under the current HCS, but the agency was unable to quantify the magnitude of these health and safety benefits (see Section VII.D. Health and Safety Benefits and Unquantified Positive Economic Effects).

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² This calculation (a) converts the costs and cost savings of the rule from 2019 dollars to 2016 dollars using the BEA (2020) implicit price deflator for Gross Domestic Product, and (b) discounts the first year costs by five years, to reflect the five years between 2016 and 2021, the scheduled year of publication of this NPRM. For further details, see Document ID 0049, tab “Tables”, E.O. 13771 Summary Table.

Table ES-1: Total Annualized Costs for All Entities Affected by the Proposed Revisions to the Hazard Communication Standard (by Industry and Provision, 7 Percent Discount Rate, 2019 Dollars)

NAICS Code	Industry	Rule Familiarization	Training	Revised SDS/Labels [a]	Released for Shipment	Labels for Very Small Containers	Total Costs
21	Mining, Quarrying, and Oil and Gas Extraction	\$39,410	\$7,194	\$264,973	\$0	\$0	\$311,577
211	Oil and Gas Extraction	\$39,410	\$7,194	\$264,973	\$0	\$0	\$311,577
31-33	Manufacturing	\$483,276	\$112,964	\$3,264,949	-\$11,397,777	-\$1,291,839	-\$8,828,427
324	Petroleum and Coal Products Manufacturing	\$19,238	\$11,539	\$1,498,159	\$0	\$0	\$1,528,936
325	Chemical Manufacturing	\$137,810	\$101,426	\$1,587,629	-\$11,397,777	-\$1,291,839	-\$10,862,751
326	Plastics and Rubber Products Manufacturing	\$68,513	\$0	\$0	\$0	\$0	\$68,513
327	Nonmetallic Mineral Product Manufacturing	\$59,127	\$0	\$0	\$0	\$0	\$59,127
331	Primary Metal Manufacturing	\$25,831	\$0	\$0	\$0	\$0	\$25,831
339	Miscellaneous Manufacturing	\$172,756	\$0	\$179,161	\$0	\$0	\$351,917
42	Wholesale Trade	\$213,209	\$0	\$0	-\$18,450,070	\$0	-\$18,236,861
423	Merchant Wholesalers, Durable Goods	\$59,554	\$0	\$0	\$0	\$0	\$59,554
424	Merchant Wholesalers, Nondurable Goods	\$153,654	\$0	\$0	-\$18,450,070	\$0	-\$18,296,415
Total		\$735,894	\$120,158	\$3,529,921	-\$29,847,846	-\$1,291,839	-\$26,753,711

Source: U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

[a] Figures in this column represent the sum of the costs for chemical reclassification and requirements in the appendices to the standard addressing precautionary statements and other mandatory language.

Note: Figures may not add to totals due to rounding.

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II. Introduction

This preamble to the proposal to modify the HCS includes a review of the events leading to the proposal, a discussion of the reasons why OSHA believes these modifications are necessary, the preliminary economic and regulatory flexibility analysis for the proposal, and an explanation of the specific revisions OSHA is proposing to make to the standard.

III. Events Leading to the Proposed Modifications to the Hazard Communication Standard

OSHA first promulgated the HCS in 1983, covering only the chemical manufacturing industry (48 FR 53280). The purpose of the standard was to provide a standardized approach for communicating workplace hazards associated with exposure to hazardous chemicals. OSHA updated the HCS in 1987 to expand coverage to all industries where workers are exposed to hazardous chemicals (52 FR 31852). In 1994, OSHA promulgated an additional update to the HCS with technical changes and amendments designed to ensure better comprehension and greater compliance with the standard (59 FR 6126). In adopting the original HCS in 1983, the agency noted the benefits of an internationally harmonized chemical hazard communication standard (48 FR 53287), and actively participated in efforts to develop one over the subsequent decades. In 2012, the agency officially harmonized the HCS with the third revision of the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS) (UN GHS, Rev. 3, 2009, Document ID 0085) (77 FR 17574).

OSHA has always envisioned that the HCS would require periodic rulemakings to maintain consistency with the GHS and incorporate the progression of scientific principles and best approaches for classification and communication of workplace hazards related to hazardous chemical exposure (77 FR 17574). This section provides information on the events that have occurred since promulgation of the 2012 HCS, with additional information on the development of the GHS and its relationship to the HCS, and explains the impetus for this proposed rule.

Several international and domestic activities have impacted the direction of the HCS and led to the updates proposed in this NPRM, including negotiations at the UN, OSHA's participation in the U.S.–Canada Regulatory Cooperation Council (RCC)

with Health Canada, and information OSHA has received from HCS stakeholders. These are discussed below.

A. International Events Affecting the Standard

The evolution of what was to become the GHS had its early beginnings with the work started in 1956 by the United Nations Economic and Social Council Committee of Experts on the Transport of Dangerous Goods (TDG) and continued in the 1990s through the United Nations Conference on Environment and Economic Development (UNCED), the United Nations International Labour Organization (ILO), and the Organization for Economic Cooperation and Development (OECD) (UN GHS, 2019, Document ID 0053). The overarching goal was to provide an internationally harmonized system to convey information to workers, consumers, and the general public on the physical, health, and environmental effects of hazardous chemicals across the globe, as well as to provide a foundation for the safe management of those chemicals.

Finalized by the UN in 2002, the GHS is intended to harmonize elements of hazard communication, including SDSs and labels, by providing a unified classification system of chemicals based on their physical and health-related hazards. The GHS is updated and revised every two years based on information and experience gained by regulatory agencies, industry, and non-governmental organizations (UN GHS, 2020, Document ID 0052). OSHA largely adopted the third revision to the GHS in 2012.

OSHA leads the U.S. Interagency GHS Coordinating Group, an interagency group that serves as a U.S. delegation to the UN. The Interagency Group works to ensure that modifications to the GHS continue to reflect U.S. agencies' key priorities and do not conflict with U.S. hazard communication and associated requirements. The group meets regularly to discuss issues related to the domestic implementation of the GHS, as well as international work being done at the United Nations Sub-Committee of Experts on the GHS (UNSCEGHS). The Interagency Group consists of representatives from OSHA, the Department of State, the Department of Transportation (DOT), the Environmental Protection Agency (EPA), the U.S. Coast Guard, the Consumer Product Safety Commission (CPSC), the Department of Energy (DOE), the Department of Defense (DOD), and the Bureau of Alcohol,

Tobacco, Firearms and Explosives (ATF). To date, OSHA is the only U.S. agency to have implemented the GHS, although CPSC regulations contain elements of the GHS (e.g., precautionary statements) (CPSC, 2006, Document ID 0175). The EPA (which initiated the U.S. working group) has proposed changes to its regulations governing significant new uses of chemical substances under the Toxic Substances Control Act that would align with the HCS and the GHS as well as OSHA's respiratory protection standard (29 CFR 1910.134) and National Institute for Occupational Safety and Health (NIOSH) respirator certification requirements (81 FR 49598).

Since OSHA's adoption of Revision 3 in 2012, the GHS has been updated five times; the latest revision, Revision 8, was published in July 2019 (UN GHS, Rev. 8, 2019, Document ID 0065). Updates to the GHS in Revision 4 (2011) included changes to hazard categories for chemically unstable gases and non-flammable aerosols and updates to, and clarification of, precautionary statements (UN GHS, 2011, Document ID 0240). Changes in Revision 5 of the GHS (2013) included a new test method for oxidizing solids; miscellaneous provisions intended to further clarify the criteria for some hazard classes (skin corrosion/irritation, severe eye damage/irritation, and aerosols) and to complement the information to be included in the SDS; revised and simplified classification and labeling summary tables; a new codification system for hazard pictograms; and revised precautionary statements (UN GHS, 2013, Document ID 0241).

Revision 6 of the GHS (2015) included a new hazard class for desensitized explosives and a new hazard category for pyrophoric gases; miscellaneous provisions intended to clarify the criteria for some hazard classes (explosives, specific target organ toxicity following single exposure, aspiration hazard, and hazardous to the aquatic environment); additional information to be included in section 9 of the SDS; revised precautionary statements; and a new example in Annex 7 addressing labelling of small packages (UN GHS, 2015, Document ID 0134). Changes in Revision 7 (2017) included revised criteria for categorization of flammable gases within Category 1; miscellaneous amendments intended to clarify the definitions of some health hazard classes; additional guidance regarding the coverage of section 14 of the SDS (which is non-mandatory under the HCS); and a new example in Annex 7 addressing labelling of small packages

with fold-out labels (UN GHS, 2017, Document ID 0094). Revision 8 (published July 2019) includes a change in classification criteria for aerosols (based on flammable properties, heat of combustion); minor changes to precautionary statements for skin irritation and serious eye damage; new provisions for use of non-animal test methods for the skin irritation/corrosion hazard class; and new precautionary pictograms for “keep out of reach of children” (UN GHS, Rev. 8, 2019, Document ID 0065). OSHA is proposing to revise the HCS to align with the GHS Revision 7; however, the agency has included select provisions from Revision 8 for consideration in this rulemaking. Major U.S. trading partners are also aligning with Revision 7. This is discussed in more detail in the introduction to Issues and Options (see Section XIV) and the introduction to Summary and Explanation (see Section XV).

The GHS model is comprehensive and forward-looking, embracing concepts defined in the principles of aggregate exposure and cumulative risk, which have been developed and/or adopted by agencies such as the U.S. EPA pesticides program and NIOSH (US EPA, 2017, Document ID 0054; Lentz, 2015, Document ID 0071). In brief, aggregate exposure considers the combined exposures of a single chemical from multiple pathways (e.g., oral, dermal, inhalation), while cumulative risk evaluates the potential adverse effects from multiple chemicals or stressors (such as heat and noise). Because of its comprehensive approach, the GHS takes into consideration multiple aspects of the intrinsic hazards of a chemical (e.g., physical, health, and environmental hazards) and makes this information available in a manner that facilitates the assessment of aggregate exposures from a single chemical and identifies factors that may contribute to cumulative risk from multiple chemical exposures. While the HCS requires employers to provide information on SDSs in sections 1–11 and 16 (12–15 are non-mandatory) for workplace settings (29 CFR 1910.1200(g)(2)), many consumer products have SDSs available to the public through the National Library of Medicine (NLM, 2020, <http://medlineplus.gov/householdproducts.html>, Document ID 0059). Thus, aggregate exposure information is available to the public for many chemicals where occupational, consumer, and environmental exposures are possible, as intended by the GHS.

An additional international activity impacting the HCS is OSHA’s participation in the RCC. The RCC was

established in 2011 to promote economic growth, job creation, and other benefits through increased regulatory coordination and transparency between the U.S. and Canada (US EOP, 2011, Document ID 0057). In June 2018, U.S.–Canada RCC principles were reaffirmed through a memorandum of understanding between the U.S. Office of Information and Regulatory Affairs (OIRA) within the White House Office of Management and Budget and the Treasury Board of Canada (US-Canada MOU, 2018, Document ID 0199). Since the RCC’s inception, OSHA and Health Canada, Canada’s corresponding governmental agency, have developed joint guidance products and consulted on respective regulatory activities. In keeping with the RCC’s goal of regulatory cooperation, OSHA is proposing several updates to the HCS that will align with Canada’s Hazardous Products Regulations (HPR), such as changes to exemptions for labeling small containers and using prescribed concentration ranges when claiming trade secrets (Health Canada, 2015, Document ID 0051).

B. Stakeholder Engagement

Since updating the HCS in 2012, OSHA has engaged stakeholders in various ways in order to keep them apprised of changes to the HCS that may have an impact on future updates to the HCS, as well as to gather information about stakeholders’ experience implementing the standard. For example, in November 2016, OSHA convened a meeting (International/ Globally Harmonized System (GHS), Docket No. OSHA–2016–0005) to inform the public that OSHA was beginning rulemaking efforts to maintain alignment of the HCS with more recent revisions of the GHS. Meeting attendees discussed topics and issues that OSHA should consider during the rulemaking. In addition, attendees provided suggestions as to the types of publications (such as guidance products) that would be helpful in complying with the standard and the topics they would like OSHA to address in future compliance assistance materials.

OSHA has also engaged stakeholders through Interagency Group public meetings, prior to each UNSCEGHS Session, to discuss the issues and proposals being presented at the UN. During this forum, stakeholders have the opportunity to provide comments or voice concerns regarding the various proposals under discussion. Stakeholders are also able to provide comments on these proposals in writing via OSHA’s docket for International/

Globally Harmonized System (GHS) (Docket No. OSHA–2016–0005). The Interagency Group considers the comments and information gathered at these public meetings and in the docket when developing the United States’ position on issues before the UN.

Additionally, in December 2018, the RCC held a stakeholder forum in Washington, DC. The purpose of the forum was to conduct senior-level discussions to proactively identify and discuss challenges, opportunities, and lessons learned regarding Canada-U.S. regulatory cooperation” (US EOP, 2018, Document ID 0252). OSHA led the session regarding chemicals management and workplace chemicals.

C. OSHA Guidance Products, Letters of Interpretation, and Directives

Since OSHA’s publication of the HCS update in 2012, the agency has published guidance documents, issued letters of interpretation (LOI), and implemented an enforcement directive. To see the guidance documents, please go to OSHA’s web page at: <https://www.osha.gov/dsg/hazcom/guidance.html>. OSHA will continue to develop guidance documents to assist employers and employees with their understanding of the HCS and is seeking comments in this NPRM on types of guidance documents that the public may find useful to understand the updated HCS. Any guidance provided will accord with the Department’s regulation at 29 CFR part 89, with a primary aim of providing helpful, plain language explanations.

OSHA has issued several letters of interpretation (LOI) in response to questions from the regulated community. These LOI provide clarification on provisions in the 2012 update to the HCS, and how they apply in particular circumstances. Some of the major issues covered in the LOI include the labeling of small containers, the labeling of chemicals released for shipment, and the use of concentration ranges for trade secrets. OSHA’s LOI on the HCS may be found at <https://www.osha.gov/laws-regs/standardinterpretations/standardnumber/1910/1910.1200%20-%20Index/result>. In addition, the agency has published a directive that provides guidance to enforcement compliance officers intended to ensure uniform enforcement of the standard by the OSHA field offices (CPL 02–02–079, OSHA, 2015, Document ID 0007; https://www.osha.gov/OshDoc/Directive_pdf/CPL_02-02-079.pdf). Several of the updates in this proposal would codify specific elements of the enforcement guidance the agency has already

provided in the LOI and the directive (see Section XV: Summary and Explanation for Regulatory Text, Appendix B and Appendix D).

IV. Need and Support for the Proposed Modifications to the Hazard Communication Standard

The HCS is the cornerstone of OSHA's risk mitigation strategy for controlling hazardous chemicals in the workplace. The importance of hazard communication in general and the HCS specifically have been well established over the past few decades, ever since OSHA first established the HCS in 1983 as a worker's "right to know" standard (OSHA Publication 3021—Workers' Rights, 2017). However, even prior to OSHA's promulgation of the HCS, there was recognition that workers needed to know the hazards encountered in the workplace and the importance of communicating, classifying, and training how to address, those hazards. The foundational goal of the HCS is to identify, understand, and communicate the hazards associated with exposure to chemicals before workers experience chronic exposure to those hazards.

OSHA first established the need for the HCS in the 1983 standard (48 FR 53282–53284) and most recently reiterated the need for the standard in 2012, when OSHA adopted the GHS hazard communication framework (77 FR 17584–17600). The 2012 HCS emphasized the need for improved quality, consistency, and comprehensibility of information provided to workers. The improved information mandated by the current HCS enables employers and workers to further reduce risks associated with chemical hazards by enabling them to identify and determine the hazards and by providing a method to indicate the severity of the relevant hazards. The HCS, as updated in 2012, also mandates information on proper storage and handling and other information on risk mitigation and management. Numerous studies examined in the final rulemaking for the 2012 HCS supported the need for a hazard communication standard that was focused on ensuring the comprehensibility of the conveyed information (77 FR 17584–17585).

OSHA is now proposing additional changes to the HCS that will serve three primary purposes: (1) Maintaining alignment with the GHS and ensuring that the standard reflects the current state of science and knowledge on relevant topics; (2) cooperating with international trading partners and other Federal agencies; and (3) responding to stakeholder experiences implementing current HCS requirements. The

proposed changes include clarifying the purpose and scope of the standard, adding definitions, codifying enforcement policies currently in OSHA's compliance directive, clarifying requirements related to the transport of hazardous chemicals, adding labeling provisions for small containers, and adopting new requirements related to preparation of SDSs and new provisions related to claiming concentration ranges as trade secrets. The agency believes that the changes proposed in this NPRM will further improve the comprehensibility and utility of the standard and allow the HCS to keep up with advances in relevant science and technology, thereby better protecting worker health and safety.

A. Maintaining Alignment With the GHS and Ensuring That the Standard Reflects the Current State of Science and Knowledge on Relevant Topics

Periodic updates to the HCS are needed to maintain pace with the general advancement of science, technology, and our understanding of the processes involved in effective communication. As stated in the 2008 ILO report, "Continuous improvement of occupational safety and health must be promoted. This is necessary to ensure that national laws, regulations, and technical standards to prevent occupational injuries, disease, and deaths are adapted periodically to social, technical, and scientific progress and other changes in the world of work." (ILO, 2008, Document ID 0181). While the tools and protective measures in place to reduce or prevent chemical-related occupational injuries and illnesses are effective, such tools and systems become less effective as time goes by and new technologies and workplace hazards emerge. Therefore, there is a need for continual improvement in the systems and processes designed to identify, communicate about, and reduce workplace exposures to chemical hazards. OSHA has always intended for the HCS to be updated periodically to reflect these advancements, as is the GHS (for further discussion see Section XIV, Issues and Options).³

³ The ILO and the World Health Organization (WHO) have also adopted an evergreen approach to workplace hazard communication (*i.e.*, an approach that ensures systems for hazard communication remain relevant and up-to-date). The ILO and WHO produce international chemical safety cards (ICSC) and maintain a database of approximately 500 data sheets designed to provide safety and health information on hazardous chemicals in a format consistent with the GHS. While not exactly like SDSs, ICSCs use GHS precautionary statements to convey safety and health information about workplace chemicals in a consistent,

The proposed changes to the HCS will result in better alignment between the standard and the continually-evolving GHS. The first edition of the UN GHS, adopted in December 2002 and published in 2003, implemented the 16-section format for SDSs that is now standard across much of the globe. As information has improved, the GHS has updated the form and content of SDSs⁴ to improve readability, minimize redundancies, and ensure hazards are communicated appropriately (UN GHS, 2017, Document ID 0060; ANS revises standard, 2005, Document ID 0237).

Information OSHA has collected since publication of the 2012 updates to the HCS indicates that aligning the HCS with the GHS has had a positive impact. Data from published studies indicate that the hazard communication approach taken in the 2012 HCS has been effective, when implemented appropriately, in enabling workers to understand, avoid, and mitigate exposures to hazardous chemicals in the workplace (Bechtoldt, 2014, Document ID 0061; Elliott, 2016, Document ID 0119). Industry representatives have indicated that workers responded positively to training on pictograms and hazard statements because it provided an opportunity to address distinctions between acute toxicity and chronic health effects (Bechtoldt, 2014, Document ID 0061). In reference to SDSs, one industry representative stated that "[b]ecause the standardized hazard statements and classifications are so precisely disclosed, it'll be a lot easier for industrial hygienists to identify the more hazardous chemicals, decide where they may need to take action, and compare the hazards of one product versus another." (Bechtoldt, 2014,

internationally-accessible manner. With participation by experts from government agencies around the world, including the U.S. (CDC/NIOSH), Canada (Health Canada and Environment Canada), and the European Commission (ECHA), ICSCs are prepared and periodically updated to account for the most recent scientific developments. Due to the robust process of preparation and peer-review, the ICSCs are considered authoritative in nature and a significant asset for workers and health professionals across the globe, including in the United States (ILO, 2019, Document ID 0069).

⁴ SDSs, as adopted by the HCS, are intended to provide comprehensive information about a substance or mixture for use in the workplace, including identification of the substance or mixture; hazard identification; composition/ingredient information; first aid measures; fire-fighting measures; accidental release measures; handling and storage; exposure controls/personal protective measures; physical and chemical properties; stability and reactivity; toxicological information; ecological information; disposal considerations; transport information; regulatory information; and other information that may be relevant to the workplace (*e.g.*, date the SDS was prepared, key literature references, and sources of data used to prepare the SDS).

Document ID 0061; Elliot, 2016, Document ID 0119). Consistent labeling requirements have also enabled employers to identify the most hazardous materials in the workplace, understand more about the health effects of these chemicals, and address which hazardous chemicals they may want to replace with safer alternatives (Bechtold, 2014, Document ID 0061).

Several studies published since the 2012 HCS adopted the 16-section SDS format indicate that the new format improves comprehension in the workplace (Elliott, 2016, Document ID 0119; Boelhouwer, 2013, Document ID 0107). However, other recent studies have shown that the system can still be improved upon. Multiple studies in various industries have demonstrated that while comprehension has improved, many SDSs lack information vital to worker protections. Problems include insufficient information on the identification of substances/mixtures; inadequate hazard identification and classification information (e.g., missing information on carcinogens and sensitizers, incorrect chemical classifications); lack of precautionary statements on safe handling; missing information on exposure controls/personal protective equipment; and missing toxicological information (Jang, 2019, Document ID 0110; Allen, 2017, Document ID 0117; DiMare, 2017, Document ID 0118; Tsai, 2016, Document ID 0116; Friis, 2015, Document ID 0120; Saito, 2015, Document ID 0191; Suleiman, 2014, Document ID 0192; Lee, 2012, Document ID 0070). A 2014 study concluded that the contents of the SDSs evaluated were generic and incomplete, lacking important safety measures and health information (Suleiman, 2014, Document ID 0192). A study on mixtures found that information on individual ingredients within mixtures was sometimes completely missing and that information on hazard characterization and classification was ambiguous and almost entirely incorrect (LeBouf, 2019, Document ID 0183). Furthermore, a 2012 study conducted by NIOSH found that SDSs for certain classes of chemicals lacked sufficient information to communicate the appropriate hazards and remedies related to engineered nanomaterials (Eastlake, 2012, Document ID 0063). A follow-up NIOSH study found some improvement in SDS preparation since implementation of the 2012 HCS; however, the study also found that there are still serious deficiencies in providing adequate information on the inherent health and safety hazards of

engineered nanomaterials, including handling and storage (Hodson, 2019, Document ID 0067).

Inadequate information on the chemical hazards and risk management practices required on SDSs can lead to overexposure to chemical hazards and puts workers at risk. The studies described above demonstrate the need for ongoing review and refinement to make certain the standard is addressing comprehensibility issues and staying relevant with current occupational safety and health tools, science, and technology. Using information gained through the experience of global stakeholders, the GHS is updated with revisions and improvements every two years. These changes have been outlined in brief in Section III (Events Leading to the Proposed Modifications to the Hazard Communication Standard) of this NPRM. The proposed updates to appendix D, which are based in part on recent revisions to the GHS, seek, among other things, to remedy the issues that have been identified by clarifying the information needed in the SDS. For example, the change in section 9 (physical characteristics to include particle characteristics) will identify exposure issues that are not addressed by the current format. This should, among other things, improve the hazard information required for nanomaterials.

Furthermore, the GHS has been updated to reflect the development of non-animal test methods for use in hazard determination and classification. The development of these test methods led to updates in Chapter 3.2 on skin corrosion/irritation that incorporated new *in vitro* test methods, and computational and *in silico* techniques, to classify chemicals for this category of hazard (UN GHS, 2018, Document ID 0242). And techniques and processes developed in the behavioral sciences have led to the development of more effective communication practices for occupational safety and health purposes (NIOSH, 2019, Document ID 0126).⁵ Studies evaluating the effectiveness of precautionary statements and pictograms used in the GHS have led to their evolution and continued revisions (Fagotto, 2003, Document ID 0125; Ta, 2010, Document ID 0115; Ta, 2011, Document ID 0194; Chan, 2017, Document ID 0017).

In addition to directly enhancing worker protections through improved hazard communication, updating the

HCS (based on the GHS) will also improve the availability of important information to support larger efforts to address workplace hazards. For example, NIOSH is exploring the use of aggregate exposures (exposures to a specific chemical or hazard from several different sources) and cumulative risk models for use in setting occupational exposure limits and assessing impacts on worker health (Lentz, 2015, Document ID 0071; Redingert, 2015, Document ID 0100). A real-world example of the potential effects of aggregate exposure comes from the increased use of nanosilver in consumer products. A recent NIOSH review of nanosilver indicates that the current OSHA PEL for silver is adequate to protect workers from silver's adverse health effects (NIOSH, 2018, Document ID 0188). However, a 2013 study looking at the increased presence of nanosilver in consumer products (e.g., use of nanosilver as an antimicrobial in clothing and materials that come into contact with food), and the increased environmental exposures from the manufacture, use, and disposal of these consumer products, indicates that the OSHA PEL may be inadequate to protect workers if nanosilver continues to be added to new consumer products (Balcher, 2013, Document ID 0097). This example highlights the importance of an effective overarching hazard communication strategy in understanding and managing exposures and risk.

Regularly updating the HCS to align with international practices also eases compliance for regulated entities because it provides greater international consistency (Bechtold, 2014, Document ID 0061). Industry groups, such as the American Petroleum Institute (API), have indicated their support for regular HCS updates as long as there is sufficient input from stakeholders (API, 2009, Document ID 0167). During the 2012 rulemaking, numerous safety organizations (including NIOSH, the American Chemical Society (ACS), the American Industrial Hygiene Association (AIHA), the American Society of Safety Engineers (ASSE), and the Society for Chemical Hazard Communication (SCHC)) have publicly supported OSHA's continued updates to the HCS (see 77 FR 17585, 17603, 17604). The Society of Toxicology has also expressed support for updating the HCS to align with the GHS as this "is an important step toward creating consistent communication about the hazards of chemicals used around the world." (see 77 FR 17585).

⁵ Holistic programs such as NIOSH's Total Worker Health (TWH) program, where behavioral science is integrated into more traditional risk-management practices, require robust hazard communication practices (Tamers, 2019, Document ID 0076).

B. Cooperating With International Trading Partners and Other Federal Agencies

In support of the second goal of this NPRM, OSHA expects that the proposed updates to the HCS will facilitate cooperation with international trading partners and other Federal agencies. With respect to the U.S. and Canada specifically, the two countries participate in the RCC, which has a goal to “reduce, eliminate, or prevent unnecessary regulatory differences between both countries while maintaining high levels of protection for health, safety, and the environment” (US-Canada MOU, 2018, Document ID 0252). OSHA continues to work with Health Canada through the RCC to develop guidance documents pertaining to hazard communication issues the two countries share and to work cooperatively through the UN GHS subcommittee (see Section III, Events Leading to the Proposed Modifications to the Hazard Communication Standard). In addition, OSHA and Health Canada share regular updates on regulatory activity. As explained in the Summary and Explanation (see Section XV), a number of the updates OSHA is proposing in this NPRM would align U.S. and Canadian hazard communication practices, thereby facilitating cooperation between the two countries, easing compliance for employers who participate in both markets, and strengthening worker protections by providing harmonized hazard communication standards across trade borders.

In addition, OSHA is proposing to update the requirements for bulk shipment under paragraph (f)(5), *Transportation* to provide additional clarity for shipments that are also regulated by the U.S. Department of Transportation (DOT). For bulk shipments, the proposed new paragraph would increase flexibility by allowing labels to be placed on the immediate container or transmitted with shipping papers, bills of lading, or by other technological or electronic means so that they are immediately available to workers in printed form on the receiving end of the shipment. And in another effort to facilitate inter-agency cooperation, OSHA is proposing new language for paragraph (f)(5) providing that where a pictogram required by the DOT appears on the label for a shipped container, the HCS pictogram for the same hazard may also be provided, but is not required.

C. Responding to Stakeholder Experiences Implementing the 2012 HCS

Finally, some of the proposed changes in this NPRM, those related to labeling of small containers and relabeling requirements for chemicals that have been released for shipment, were developed in response to feedback and comments received from stakeholders since the promulgation of the 2012 updates to the HCS (Collatz, 2015, Document ID 0174; Ghosh, 2015, Document ID 0180). With respect to the labeling of small containers, issues raised by stakeholders included concerns about insufficient space on the label to highlight the most relevant safety information, problems with the readability of information on small labels, and challenges associated with using fold-out labels for certain small containers that need special handling (Watters, 2013, Document ID 0200; Collatz, 2015, Document ID 0174; Blankfield, 2017, Document ID 0170). The proposed updates to the HCS related to the labeling of small containers are designed to address these issues. Furthermore, OSHA believes that adopting a uniform standard for the labeling of small containers will enhance worker protections by providing more clarity and certainty about the hazards posed by the chemicals contained in such containers (see Section X Summary and Explanation for (f)(12), Small container labeling).

Similarly, the proposed revisions to paragraph (f)(11), which address the relabeling of chemicals that have been released for shipment, are designed to address stakeholder concerns about the difficulty some manufacturers have in complying with paragraph (f)(11), especially in the case of chemicals that travel through long distribution cycles (Kenyon, 2017, Document ID 0182). Many products have straightforward supply chains and are packaged, labeled, and promptly shipped downstream. Other products, for example in the agrochemical sector, are packaged and labeled when they leave the chemical manufacturer's facility, but may reside at a warehouse or distribution facility for extended periods of time (e.g., several years) before being shipped downstream. There are also instances where products may be returned from the downstream users to the distribution facility and then shipped to other customers (NGFA, 2016, Document ID OSHA–2016–0005–0018; AFIA, 2016, Document ID OSHA–2016–0005–0017). OSHA believes the proposed revisions to paragraph (f)(11)

to provide that relabeling is not required for chemicals that have been released for shipment and are awaiting future distribution will accommodate these concerns; the proposal would also maintain worker protections by requiring the chemical manufacturer or importer to provide an updated label for each individual container with each shipment.

V. Pertinent Legal Authority

A. Background

The purpose of the Occupational Safety and Health Act of 1970 (the “OSH Act” or “Act”) (29 U.S.C. 651 *et seq.*) is “to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources.” 29 U.S.C. 651(b). To achieve this goal, Congress authorized the Secretary of Labor to promulgate occupational safety and health standards pursuant to notice and comment. 29 U.S.C. 655(b). An occupational safety and health standard is a standard “which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.” 29 U.S.C. 652(8).

The OSH Act also authorizes the Secretary to “modify” or “revoke” any occupational safety or health standard, 29 U.S.C. 655(b), and under the Administrative Procedure Act, regulatory agencies generally may revise their rules if the changes are supported by a reasoned analysis. See *Encino Motorcars, LLC v. Navarro*, U.S., 136 S. Ct. 2117, 2125–26 (2016); *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 42 (1983). In passing the OSH Act, Congress recognized that OSHA should revise and replace its standards as “new knowledge and techniques are developed.” S. Rep. 91–1282 at 6 (1970). The Supreme Court has observed that administrative agencies “do not establish rules of conduct to last forever, and . . . must be given ample latitude to adapt their rules and policies to the demands of changing circumstances.” *Motor Vehicle Mfrs. Ass’n*, 463 U.S. at 42 (internal quotation marks and citations omitted).

Before the Secretary can promulgate any permanent health or safety standard, he must make a threshold finding that significant risk is present and that such risk can be eliminated or lessened by a change in practices. *Indus. Union Dep’t v. Am. Petroleum Inst.*, 448 U.S. 607, 642 (1980) (plurality opinion)

(“Benzene”). As explained more fully below, OSHA need not make additional findings on risk for this proposal because OSHA previously determined that the HCS addresses a significant risk. 77 FR 17603–17604.

In promulgating a standard under, and making the determinations required by, the OSH Act, OSHA’s determinations will be deemed conclusive if they are “supported by substantial evidence in the record considered as a whole.” 29 U.S.C. 655(f). OSHA must use the “best available evidence,” which includes “the latest available scientific data in the field”; “research, demonstrations, experiments, and such other information as may be appropriate”; and “experience gained under this and other health and safety laws.” 29 U.S.C. 655(b)(5).

B. Authority—Section 6(b)(5)

The HCS is a health standard promulgated under the authority of section 6(b)(5) of the OSH Act. See *Associated Builders & Contractors, Inc. v. Brock*, 862 F.2d 63, 67–68 (3d Cir. 1988); *United Steelworkers of Am. v. Auchter*, 763 F.2d 728, 735 (3d Cir. 1985); 77 FR 17601. Section 6(b)(5) of the OSH Act provides that in promulgating health standards dealing with toxic materials or harmful physical agents, the Secretary must “set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life.” 29 U.S.C. 655(b)(5). Thus, once OSHA determines that a significant risk due to a health hazard is present and that such risk can be reduced or eliminated by an OSHA standard, section 6(b)(5) requires OSHA to issue the standard, based on the best available evidence, that “most adequately assures” employee protection, subject only to feasibility considerations. As the Supreme Court has explained, in passing section 6(b)(5), Congress “place[d] . . . worker health above all other considerations save those making attainment of this ‘benefit’ unachievable.” *Am. Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490, 509 (1981) (“*Cotton Dust*”).

C. Other Authority

The HCS is also promulgated under the authority of section 6(b)(7) of the OSH Act. See *United Steelworkers*, 763 F.2d at 730; 77 FR 17601. Section 6(b)(7) of the OSH Act provides in part: “Any

standard promulgated under this subsection shall prescribe the use of labels or other appropriate forms of warning as are necessary to insure that employees are apprised of all hazards to which they are exposed, relevant symptoms and appropriate emergency treatment, and proper conditions and precautions of safe use or exposure.” 29 U.S.C. 655(b)(7). Section 6(b)(7)’s labeling and employee warning requirements provide basic protections for employees in the absence of specific permissible exposure limits, particularly by providing employers and employees with information necessary to design work processes that protect employees against exposure to hazardous chemicals in the first instance.

The last sentence of section 6(b)(7) provides that the Secretary, in consultation with the Secretary of Health and Human Services, may by rule promulgated pursuant to section 553 of Title 5, make appropriate modifications in the foregoing requirements relating to the use of labels or other forms of warning, monitoring or measuring, and medical examinations, as may be warranted by experience, information, or medical or technological developments acquired subsequent to the promulgation of the relevant standard. 29 U.S.C. 655(b)(7). OSHA used the authority granted by this paragraph to promulgate the 2012 revisions to the HCS, 77 FR 17602, and this provision provides additional authority for the current proposal.

This proposal to update the HCS fits well within the authority granted by the last sentence of section 6(b)(7). The changes proposed would constitute a “modification” of the HCS regarding “the use of labels or other forms of warning.” As explained more fully elsewhere in this preamble, OSHA believes the proposed updates to be “appropriate” based on “experience, information, or medical or technological developments acquired subsequent to the promulgation of the relevant standard.” The updates found in GHS Rev. 7 may be considered a “technological development” that has occurred since the promulgation of the HCS in 2012 and are also “warranted by experience [and] information.” The GHS was negotiated and drafted through the involvement of labor, industry, and governmental agencies, and thus represents the collective experience and information on hazard communication gathered by the participants in these sectors over the last several decades. See 71 FR 53617, 53618–53619.⁶ See also

⁶ The last sentence of section 6(b)(7) requires consultation with the Secretary of Health and

Section III of this preamble, Events Leading to the Proposed Modifications to the Hazard Communication Standard.

Authority for the HCS is also found in section 8, paragraphs (c) and (g), of the OSH Act. Section 8(c)(1) of the OSH Act empowers the Secretary to require employers to make, keep, and preserve records regarding activities related to the OSH Act and to make such records available to the Secretary. 29 U.S.C. 657(c)(1). Section 8(g)(2) of the OSH Act empowers the Secretary to “prescribe such rules and regulations as he may deem necessary to carry out [his] responsibilities” under the Act. 29 U.S.C. 657(g)(2).

D. Significant Risk

As required for standards promulgated under section 6(b)(5) of the OSH Act, OSHA determined that the HCS would substantially reduce a significant risk of material harm. Most OSHA health standards protect employees by imposing requirements when employees are exposed to a concentration of a hazardous substance that OSHA has found creates a significant risk of material health impairment. Thus, in making the significant risk determination in these cases, OSHA measures and assesses the hazards of employee exposures in order to determine the level at which a significant risk arises.

OSHA took a different approach to its significant risk determination when first promulgating the HCS in 1983. Rather than attempting to assess the risk associated with exposures to each hazardous chemical in each industry to determine if that chemical posed a significant risk in that industry, OSHA took a more general approach. It relied on NIOSH data showing that about 25 million or about 25 percent of American employees were potentially exposed to one or more of 8,000 NIOSH-identified chemical hazards and that for the years 1977 and 1978 more than 174,000 illnesses were likely caused by exposure to hazardous chemicals. 48 FR 53282. OSHA then noted the consensus evident in the record among labor, industry, health professionals, and government that an “effective [F]ederal standard requiring employers to identify workplace hazards, communicate hazard information to employees, and train employees in recognizing and avoiding those hazards” was necessary to protect employee health. 48 FR

Human Services. OSHA briefed NIOSH on this proposal during a collaboration meeting held in December 2018, which was attended by the Director of NIOSH, and NIOSH expressed its support. NIOSH also supported OSHA’s update of the HCS in 2012. See 77 FR 17603.

53283. OSHA determined that the HCS addressed a significant risk because “inadequate communication about serious chemical hazards endangers workers,” and that the practices required by the standard were “necessary or appropriate to the elimination or mitigation of these hazards.” 48 FR 53321. The U.S. Court of Appeals for the Third Circuit agreed that “inadequate communication is itself a hazard, which the standard can eliminate or mitigate.” *United Steelworkers*, 763 F.2d at 735. That court has upheld OSHA’s determination of significant risk as sufficient to justify the HCS. See *Associated Builders & Contractors*, 862 F.2d at 67–68 (discussing the history of its review of the issue).

OSHA reaffirmed its finding of significant risk in adopting revisions to the HCS in 1994. See 59 FR 6126–6133. When revising the HCS to adopt the GHS model in 2012, OSHA found that there remained a “significant risk of inadequate communication” of chemical hazards in the workplace and that adopting the standardized requirements of the GHS would substantially reduce that risk by improving chemical hazard communications. 77 FR 17603–17604.

In previous rulemakings, OSHA rejected suggestions that the hazard assessment and communication obligations of the HCS should arise only where the downstream use creates a significant risk because it is difficult, if not impossible, for OSHA or manufacturers and importers to know in advance where these risks might occur. See 48 FR 53295–53296; 59 FR 6132. Further, it is only by the provision of hazard information that downstream employers and employees can determine how to use the chemical so that exposure and risk may be minimized. See 48 FR 53295–53296; 59 FR 6132. Thus, the HCS protects employees from significant risk by requiring communications about all chemicals that may present a hazard to employees, regardless of the exposure or risk levels any particular downstream user might actually experience. See *Durez Div. of Occidental Chem. Corp. v. OSHA*, 906 F.2d 1, 3–4 (D.C. Cir. 1990); *Gen. Carbon Co. v. OSHRC*, 860 F.2d 479, 484–85 (D.C. Cir. 1988).

For the changes proposed in this NPRM, OSHA has not made a new preliminary finding of significant risk, but is proposing changes that are reasonably related to the purpose of the HCS as a whole. When, as here, OSHA has previously determined that its standard substantially reduces a significant risk, it is unnecessary for the

agency to make additional findings on risk for every provision of that standard. See, e.g., *Pub. Citizen Health Research Grp. v. Tyson*, 796 F.2d 1479, 1502 n.16 (D.C. Cir. 1986) (rejecting the argument that OSHA must “find that each and every aspect of its standard eliminates a significant risk”). Rather, once OSHA makes a general significant risk finding in support of a standard, the next question is whether a particular requirement is reasonably related to the purpose of the standard as a whole. See *Asbestos Info. Ass’n/N. Am. v. Reich*, 117 F.3d 891, 894 (5th Cir. 1997); *Forging Indus. Ass’n v. Sec’y of Labor*, 773 F.2d 1436, 1447 (4th Cir. 1985); *United Steelworkers of Am., AFL–CIO–CLC v. Marshall*, 647 F.2d 1189, 1237–38 (D.C. Cir. 1980) (“*Lead I*”).

Furthermore, the Supreme Court has recognized that protective measures like those called for by the HCS may be imposed in workplaces where chemical exposure levels are below that for which OSHA has found a significant risk. In *Benzene*, the Court recognized that the “backstop” provisions of section 6(b)(7) allow OSHA to impose information requirements even before the employee is exposed to the significant risk. See *Benzene*, 448 U.S. at 657–58 & n.66. Rather than requiring a finding of significant risk, the last sentence of section 6(b)(7) provides other assurances that OSHA is exercising its authority appropriately by requiring the involvement of the Secretary of Health and Human Services, and by limiting the authority only to modifications that are based on “experience, information, or medical or technological developments” acquired since the promulgation of the standard in the limited areas of hazard communication, monitoring, and medical examinations. Therefore, OSHA need not make any new significant risk findings; rather, the final rule is supported by the significant risk findings that OSHA made when it adopted the current HCS.⁷ See 77 FR 17602.

⁷ Section 6(b)(7) of the OSH Act also exempts modifications to hazard communication, monitoring, and medical examination requirements from the standard-setting requirements of section 6(b), and so evidences Congress’ intent to provide OSHA with an expedited procedure to update these requirements. The last sentence of section 6(b)(7) merely allows these requirements to be updated to reflect the latest knowledge available. The authorization to use Administrative Procedure Act notice and comment procedures rather than the more elaborate framework established by section 6(b) demonstrates congressional intent to treat such modifications differently from rulemakings to adopt standards. Congress envisaged a simple, expedited process that is inconsistent with the idea that OSHA must undertake additional significant risk analyses before exercising this authority. See 77 FR 17602.

E. Feasibility

Because section 6(b)(5) of the OSH Act explicitly requires OSHA to set health standards that eliminate risk “to the extent feasible,” OSHA uses feasibility analysis to make standards-setting decisions dealing with toxic materials or harmful physical agents. 29 U.S.C. 655(b)(5); *Cotton Dust*, 452 U.S. at 509. Feasibility in this context means “capable of being done, executed, or effected.” *Cotton Dust*, 452 U.S. at 508–09. Feasibility has two aspects, economic and technological. *Lead I*, 647 F.2d at 1264. A standard is technologically feasible if the protective measures it requires already exist, can be brought into existence with available technology, or can be created with technology that can reasonably be expected to be developed. See *id.* at 1272. A standard is economically feasible if industry can absorb or pass on the cost of compliance without threatening its long-term profitability or competitive structure. See *Cotton Dust*, 452 U.S. at 530 n.55; *Lead I*, 647 F.2d at 1265. As discussed more fully in Section VII.E of this preamble, Technological Feasibility, OSHA has preliminarily determined that compliance with the proposed revisions to the HCS is technologically feasible for all affected industries because compliance can be achieved with readily and widely available technologies. As discussed more fully in Section VII.G, Economic Feasibility and Impacts, OSHA has preliminarily determined that the proposed changes to the HCS are economically feasible because employers can comply without threatening the long-term profitability or competitive structure of any affected industries.

VI. OMB Review Under the Paperwork Reduction Act of 1995

A. Overview

OSHA is proposing to revise the Hazard Communication Standard (HCS), 29 CFR 1910.1200, which contains collection of information that are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (PRA), 44 U.S.C. 3501 *et seq.*, and OMB regulations at 5 CFR part 1320. The agency is planning to revise and update the existing previously-approved paperwork package under OMB control number 1218–0072.

The PRA defines “collection of information” to mean “the obtaining, causing to be obtained, soliciting, or requiring the disclosure to third parties or the public, of facts or opinions by or for an agency, regardless of form or

format.” 44 U.S.C. 3502(3)(A). Under the PRA, a Federal agency cannot conduct or sponsor a collection of information unless OMB approves it and the agency displays a currently valid OMB control number. 44 U.S.C. 3507. Also, notwithstanding any other provision of law, no employer shall be subject to penalty for failing to comply with a collection of information if the collection of information does not display a currently valid OMB control number. 44 U.S.C. 3512.

B. Solicitation of Comments

OSHA prepared and submitted an Information Collection Request (ICR) to OMB proposing to revise certain collection of information currently contained in that paperwork package in accordance with 44 U.S.C. 3507(d). The agency solicits comments on the revision of the collection of information requirements and reduction in estimated burden hours associated with these requirements, including comments on the following items:

- Whether the collection of information are necessary for the proper

performance of the agency’s functions, including whether the information is useful;

- The accuracy of OSHA’s estimate of the burden (time and cost) of the collection of information, including the validity of the methodology and assumptions used;
- The quality, utility, and clarity of the information collected; and
- Ways to minimize the compliance burden on employers, for example, by using automated or other technological techniques for collecting and transmitting information.

C. Proposed Information Collection Requirements

As required by 5 CFR 1320.5(a)(1)(iv) and 1320.8(d)(2), the following paragraphs provide information about the ICR.

1. *Title:* Hazard Communication Standard.

2. *Description of the ICR:* The proposal would revise the currently approved Hazard Communication ICR and change the existing collection of information requirements currently approved by OMB.

3. *Brief Summary of the Information Collection Requirements:* This proposal would revise and clarify the collection of information contained in the existing ICR. Specifically, OSHA is proposing to (1) add to paragraph (d)(1) that the chemical manufacturer or importer shall determine for each chemical the hazard classes, and where appropriate, the category of each class that apply to the chemical being classified under normal conditions of use and foreseeable emergencies; (2) add language to paragraph (f)(1) requiring that the chemical manufacturer, importer, or distributor ensure labels on shipped containers bear the date the chemical is released for shipment; (3) revise paragraph (f)(5) by adding two new provisions related to bulk shipments of chemicals; (4) revise paragraph (f)(11) by adding a provision related to release for shipment that requires updated labels accompany each shipment; and (5) add new labeling requirements for small containers at paragraph (f)(12). See Table 1.

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Table 1 -- Collection of Information Requirements Being Revised in the Hazard Communication Standard

Section number and title	Currently approved collection of information requirements	Proposed collection of information requirements
§1910.1200 (d)(1)	<i>§1910.1200(d)(1)</i> - Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to classify the chemicals in accordance with this section. For each chemical, the chemical manufacturer or importer shall determine the hazard classes, and, where appropriate, the category of each class that apply to the chemical being classified. Employers are not required to classify chemicals unless they choose not to rely on the classification performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.	<i>§1910.1200(d)(1)</i> - Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to classify the chemicals in accordance with this section. For each chemical, the chemical manufacturer or importer shall determine the hazard classes, and, where appropriate, the category of each class that apply to the chemical being classified <i>under normal conditions of use and foreseeable emergencies. The hazard classification shall include any hazards associated with a change in the chemical’s physical form or resulting from a reaction with other chemicals under normal conditions of use.</i> Employers are not required to classify chemicals unless they choose not to rely on the classification performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

Table 1, continued -- Collection of Information Requirements Being Revised in the Hazard Communication Standard

Section number and title	Currently approved collection of information requirements	Proposed collection of information requirements
§1910.1200 (f)(1) -- Labels on shipped containers	<p>§1910.1200(f)(1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked. Hazards not otherwise classified do not have to be addressed on the container. Where the chemical manufacturer or importer is required to label, tag, or mark the following information shall be provided:</p> <ul style="list-style-type: none"> • Product identifier; • Signal word; • Hazard statement(s); • Pictogram(s); • Precautionary statement(s); and, • Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party. 	<p>§1910.1200(f)(1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked. Hazards not otherwise classified <i>and hazards resulting from a reaction with other chemicals under normal conditions of use</i> do not have to be addressed on the container. Where the chemical manufacturer, importer or distributor is required to label, tag, or mark the following information shall be provided:</p> <ul style="list-style-type: none"> • Product identifier; • Signal word; • Hazard statement(s); • Pictogram(s); • Precautionary statement(s); • Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party; <i>and,</i> • <i>Date chemical is released for shipment.</i>
§1910.1200 (f)(5) -- Transportation	<p>§1910.1200(f)(5)</p> <p>Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under that Act by the Department of Transportation.</p>	<p>§1910.1200(f)(5) – Transportation.</p> <ul style="list-style-type: none"> • Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under that Act by the Department of Transportation. • <i>The label for bulk shipments of hazardous chemicals may be on the</i>

Table 1, continued -- Collection of Information Requirements Being Revised in the Hazard Communication Standard

Section number and title	Currently approved collection of information requirements	Proposed collection of information requirements
		<p><i>immediate container or may be transmitted with the shipping papers, bills of lading, or other technological or electronic means so that it is immediately available to workers in printed form on the receiving end of shipment.</i></p> <ul style="list-style-type: none"> • <i>Where a pictogram required by the Department of Transportation under Title 49 of the Code of Federal Regulations appears on the label for a shipped container, the pictogram specified in appendix C.4 for the same hazard is not required on the label.</i>
<p>§1910.1200 (f)(11)</p>	<p>§1910.1200(f)(11) - Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within six months of becoming aware of the new information, and shall ensure that labels on containers of hazardous chemicals shipped after that time contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importer, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.</p>	<p>§1910.1200(f)(11) - Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within six months of becoming aware of the new information, and shall ensure that labels on containers of hazardous chemicals shipped after that time contain the new information. <i>Chemicals that have been released for shipment and are awaiting future distribution need not be relabeled; however, the chemical manufacturer or importer must provide the updated label for each individual container with each shipment.</i> If the chemical is not currently produced or imported, the chemical manufacturer, importer, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.</p>
<p>§1910.1200 (f)(12) – Small container labeling</p>	<p>[none]</p>	<p>§1910.1200(f)(12) - Small container labelling</p> <ul style="list-style-type: none"> • <i>Paragraph (f)(12) applies where the chemical manufacturer, importer, or distributor can demonstrate that it is not feasible to use pull-out labels, fold-</i>

Table 1, continued -- Collection of Information Requirements Being Revised in the Hazard Communication Standard

Section number and title	Currently approved collection of information requirements	Proposed collection of information requirements
		<p><i>back labels, or tags containing the full label information required by (f)(1).</i></p> <ul style="list-style-type: none"> • <i>For a container less than or equal to 100 ml capacity, the chemical manufacturer, importer, or distributor must include, at a minimum, the following information on the label of the container:</i> <ul style="list-style-type: none"> ○ <i>Product identifier;</i> ○ <i>Pictogram(s);</i> ○ <i>Signal word;</i> ○ <i>Chemical manufacturer's name and phone number; and</i> ○ <i>A statement that the full label information for the hazardous chemical is provided on the immediate outer package.</i> • <i>For a container less than or equal to 3 ml capacity, where the chemical manufacturer, importer, or distributor can demonstrate that any label interferes with the normal use of the container, no label is required, but the container must bear, at a minimum, the product identifier.</i> • <i>For all small containers covered by (f)(12)(ii) or (iii), the immediate outer package must include:</i> <ul style="list-style-type: none"> ○ <i>The full label information required by (f)(1) for each hazardous chemical in the immediate outer package. The label must not be removed or defaced, as required by (f)(9).</i> ○ <i>A statement that the small container(s) inside must be stored in the immediate outer package bearing the complete label when not in use.</i>

8. *Number of Responses*: 74,019,955.
 9. *Average Time per Response*: Varies.
 10. *Estimated Annual Total Burden Hours*: 7,023,513.

11. *Estimated Annual Total Cost (Operation and maintenance)*: \$45,676,443.

D. Submitting Comments

Members of the public who wish to comment on the revisions to the paperwork requirements in this proposal must send their written comments to the Office of Information and Regulatory Affairs, Attn: OMB Desk Officer for the Department of Labor, OSHA (RIN-1218-AC93), Office of Management and Budget, Room 10235, Washington, DC 20503, email: OIRA_submission@omb.eop.gov. The agency encourages commenters also to submit their comments on the paperwork requirements to the rulemaking docket (Docket Number OSHA-2019-0001) along with comments on other parts of the proposed rule. For instructions on submitting these comments to the rulemaking docket, see the sections of this **Federal Register** document titled **DATES** and **ADDRESSES**. Comments submitted in response to this document are public records; therefore, OSHA cautions commenters about submitting personal information such as Social Security numbers and dates of birth.

E. Docket and Inquiries

To access the docket to read or download comments and other materials related to this paperwork determination, including the complete ICR (containing the Supporting Statement with attachments describing the paperwork determinations in detail) use the procedures described under the section of this document titled **ADDRESSES**.

You also may obtain an electronic copy of the complete ICR by visiting the web page at: <http://www.reginfo.gov/public/do/PRAMain>, scroll under “Currently Under Review” to “Department of Labor (DOL)” to view all of the DOL’s ICRs, including those ICRs submitted for proposed rulemakings. To make inquiries, or to request other information, contact Ms. Seleda Perryman, Directorate of Standards and Guidance, telephone (202) 693-2222.

VII. Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis

A. Introduction and Summary

Under Executive Order 12866, OMB’s Office of Information and Regulatory Affairs (OIRA) determines whether a

regulatory action is significant and, therefore, subject to the requirements of Executive Order 12866 and OMB review. Section 3(f) of Executive Order 12866 defines a “significant regulatory action” as an action that is likely to result in a rule that (1) has an annual effect on the economy of \$100 million or more, or adversely affects in a material way a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local or tribal governments or communities (also referred to as economically significant); (2) creates serious inconsistency or otherwise interferes with an action taken or planned by another agency; (3) materially alters the budgetary impacts of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or (4) raises novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in Executive Order 12866. Upon review, OMB has determined that this proposed rule is a significant regulatory action (“Other Significant”) under Executive Order 12866. Pursuant to the Congressional Review Act (5 U.S.C. 801 *et seq.*), OIRA designated that this rule is not a “major rule,” as defined by 5 U.S.C. 804(2).

OSHA has made a preliminary determination that this action is not an economically significant regulatory action under section 3(f)(1) of Executive Order 12866 because it is not likely to have an annual effect on the economy of \$100 million or more. This proposed rule is expected to be an Executive Order 13771 deregulatory action. Details on the estimated cost-savings of this rule can be found in the economic analysis below. Executive Order 13563 directs agencies to adopt a regulation only upon a reasoned determination that its benefits justify its costs; tailor the regulation to impose the least burden on society, consistent with obtaining the regulatory objectives; and in choosing among alternative regulatory approaches, select those approaches that maximize net benefits. Executive Order 13563 recognizes that some benefits are difficult to quantify and provides that, where appropriate and permitted by law, agencies may consider and discuss qualitatively values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts.

OSHA has prepared this Preliminary Economic Analysis (PEA), including a Preliminary Regulatory Flexibility Analysis Certification, for the proposed modifications to the HCS. Supporting materials prepared by OSHA (including

spreadsheets) are available in the public docket for this rulemaking, Docket ID OSHA-2019-0001, through www.regulations.gov. OSHA invites comment on any aspects of this PEA.

In this PEA, OSHA estimates that the proposed amendments to the HCS would result in annualized net cost savings of \$26.8 million at a 7 percent discount rate. Annualized at a 3 percent discount rate, OSHA estimates that the proposed amendments to the rule would lead to net cost savings of \$27.5 million per year. Under a perpetual time horizon to allow for cost comparisons under Executive Order 13771, OSHA estimates that at a discount rate of 7 percent the net cost savings of the proposed amendments to the HCS would be \$19.6 million per year in 2016 dollars.⁸ OSHA expects that the proposed revisions to the HCS would also result in modest improvements in worker health and safety above those already being achieved under the current HCS, but the agency is unable to quantify the magnitude of these benefits.

B. Need for Regulation

Employees in work environments covered by OSHA’s HCS are exposed to a variety of significant hazards associated with chemicals used in the workplace that can and do cause serious injury, illness, and death. The HCS serves to ensure that both employers and employees are provided the information they need about these chemical hazards. The current HCS contains a set of requirements for chemical products, including mandatory hazard classification, labeling requirements, provisions for providing detailed information (in SDSs), and label updating requirements. These requirements are based on Revision 3 of the GHS, which was adopted by the UN Committee and Sub-Committee of Experts on the GHS in December 2008.

OSHA has preliminarily determined that the proposed revisions to the HCS would make employers’ hazard communication programs more worker-protective, efficient, and effective through standardizing practices nationally and internationally. In addition, aligning with the GHS Rev. 7 would continue to facilitate

⁸ This calculation (a) converts the costs and cost savings of the rule from 2019 dollars to 2016 dollars using the BEA (2020) implicit price deflator for Gross Domestic Product, and (b) discounts the first year costs by five years, to reflect the five years between 2016 and 2021, the scheduled year of publication of this NPRM. For further details, see Document ID 0049, tab Tables, E.O. 13771 Summary Table.

international trade, as a number of U.S. trading partners are also preparing to align with the GHS Rev. 7.

The proposed revisions to the HCS include the following notable changes to improve the U.S. hazard communication system:

- Maintain alignment with the GHS
 - Adding classification categories for aerosols, desensitized explosives, and flammable gases; and
 - Updating select hazard and precautionary statements for clearer and more precise hazard information.
- Address issues identified in implementing the HCS 2012
 - Updating labeling requirements for small containers; and
 - Updating labeling requirements for packaged containers that have been released for shipment.

As discussed in Section F of this PEA, the estimated costs and cost savings resulting from the proposed revisions to the HCS consist of five main categories: (1) The cost of reclassifying affected chemicals and revising the corresponding SDSs and labels to achieve consistency with the reclassification (per proposed changes to appendix B), and the cost of revising SDSs and labels to conform with new precautionary statements and other new mandatory language in the appendices to the HCS (per proposed changes to appendices C and D); (2) the cost of management familiarization and other management-related costs (associated with all of the proposed revisions to the standard); (3) the cost of training employees as necessitated by the proposed changes to the HCS (see existing 29 CFR 1910.1200(h)(1)); (4) the cost savings resulting from the new released-for-shipment provision (proposed revisions to 29 CFR 1910.1200(f)(11)); and (5) the cost savings from limiting labeling requirements for certain very small containers (proposed 29 CFR 1910.1200(f)(12)). The first three categories are considered to be one-time costs and the last two categories are cost savings that would accrue to employers annually.

The proposed changes to the HCS would maintain the uniformity of hazard information with the GHS and would, accordingly, serve to improve the efficiency and effectiveness of the existing hazard communication system in the U.S., ensure that updated and advanced HCS methods are recognized, and reduce unnecessary barriers to trade. In short, the GHS is a “uniformity standard” for the presentation of hazard information (Hemenway, 1975,

Document ID 0050). Much like other uniformity standards, such as driving on the right side of the road (in the U.S.), screw threads for fire hose connectors, “handshake” protocols for communication between computers, and, for that matter, language, the GHS provides significant efficiencies and economies.⁹

Since publication of the update to the HCS in 2012, there continues to be movement by U.S. trading partners toward maintaining standardization, consistent with the revisions in the GHS. However, OSHA does not believe that full and comprehensive standardization in accordance with the GHS, or the goal of harmonizing the U.S. system with the international one, can be achieved voluntarily in the absence of regulation.

First, the market alone will not ensure alignment with the GHS Rev. 7. In some cases (e.g., aerosols, desensitized explosives), the GHS Rev. 7 contains different hazard classes or classification criteria than the current HCS, and it would be impermissible for a manufacturer to comply with the GHS Rev. 7 rather than the criteria in the existing HCS. Moreover, making compliance with the latest revision of the GHS optional undermines the goal of harmonizing classification criteria and label elements. Second, while the costs of creating SDSs and labels are borne directly by the chemical producers, maintaining alignment with the GHS benefits the users of hazardous chemicals. These users include employers who are direct customers of chemical manufacturers, employees who use or are exposed to workplace chemicals, and emergency responders

⁹ A specification standard, such as an engineering standard, would spell out, in detail, the equipment or technology that must be used to achieve compliance. The usual rationale for a specification standard is that compliance would be difficult to verify under a performance standard; hence, a specification standard would better protect employees against the risk in question. A specification standard would generally not provide the efficiencies or economies (such as easier, less expensive training on uniform pictograms and a uniform SDS format made possible by the GHS) to the regulated community that a uniformity standard would. On the contrary, a specification standard could impose additional costs on some firms that may be able to effectively protect workers using a cheaper alternative approach if such flexibility were permitted.

It is also worth noting that, for uniformity standards with technological implications, the benefits of reduced information costs, economies of uniformity, and facilitation of exchange may need to be weighed against possible losses of flexibility, experimentation, and innovation. However, because the GHS is limited to the presentation of hazard information and does not involve other than incidental technological or strategic considerations, the possible costs of uniformity here would be minuscule.

who typically have no market relationship with the chemical producers. Even if market forces could ensure the socially optimal approach to SDSs between chemical manufacturers and their customers, there are limited market forces at work between the chemical manufacturer and two key sets of users—the employees and the emergency response community. Therefore, the benefits achieved by maintaining alignment with the GHS are unlikely to be obtained in the private market without regulation.

OSHA recognizes that there will be *some* market pressure to align with the GHS Rev. 7 as its adoption expands internationally.¹⁰ Some firms in the U.S. may think that they have no need to follow the GHS because they do not ship their products internationally. These firms may not realize the extent to which they are involved in international trade. There are probably few companies that have products that are never involved in international trade or that never import chemical products requiring hazard information.¹¹ Nonetheless, even the small percentage of U.S. companies that only conduct business domestically are required to identify and communicate hazards to workers under the HCS. Many chemical producers ship their products to distributors and are unaware of where their products are ultimately used. These distributors might well put pressure on their suppliers to maintain compliance with the GHS. Further, small companies sell chemicals to larger companies. The larger companies may use those chemicals to make other products that are exported. These larger companies might also pressure their small-firm suppliers to align with the GHS. Nevertheless, relying solely on market pressures would surely involve a long transition period, with attendant

¹⁰ See <https://www.unece.org/fileadmin/DAM/trans/doc/2018/dgac10c4/ST-SG-AC10-C4-70e.pdf>, pp. 12–13 (UN GHS, 2018, Document ID 0040).

¹¹ According to the U.S. International Trade Commission, U.S. imports of chemicals and related products increased 23 percent from 2015 (\$260.4 billion) to 2019 (\$320.1 billion); and U.S. exports of chemicals and related products increased 7 percent from 2015 (\$227.7 billion) to 2019 (\$243.7 billion). See https://usitc.gov/research_and_analysis/trade_shifts_2019/chemicals.htm, accessed October 2, 2020 (Document ID 0234). The International Trade Administration reported that the U.S. chemical industry accounted for 18 percent of global chemical shipments. See <https://www.selectusa.gov/chemical-industry-united-states>, accessed October 2, 2020 (Document ID 0236). The American Chemistry Council reported that in 2019, total U.S. chemical exports accounted for 10 percent of all U.S. goods exports and 10 percent of all global chemical exports. See <https://www.americanchemistry.com/Policy/Trade/US-Chemicals-Trade-by-the-Numbers.pdf>, accessed October 2, 2020 (Document ID 0235).

losses in worker protection and production efficiencies, and it is unlikely that the market alone will ensure full alignment with the GHS for reasons described above.

The proposed changes to the HCS would involve costs and cost savings mainly for manufacturers and importers. Manufacturers and importers of chemicals would also achieve benefits—in part because they themselves benefit as both producers and users, and in part as a result of foreign trade benefits. Some manufacturers may not obtain trade benefits unless they engage in chemical export. International harmonization of hazard communication requirements may also make it easier for small companies to engage in international trade if they so desire (see additional discussion below in VII.D. Health and Safety Benefits and Unquantified Positive Economic Effects).

Of more significance to the concerns of the OSH Act, the proposed changes would also provide health benefits from improved hazard classification and communication; although unquantified in this proposal, these benefits would include reductions in worker illnesses, injuries, and fatalities (see additional discussion below in VII.D. Health and Safety Benefits and Unquantified Positive Economic Effects).

Because many of the health and safety benefits and cost savings described in this analysis require uniformity and are dispersed among a network of producers and users, only some of which have direct market relationships with each other, OSHA believes maintaining a single, uniform standard can best achieve the full benefits available from a hazard communications system.

C. Profile of Affected Industries, Establishments, and Employees

The proposed modifications to the standard include revised criteria for classification of certain health and physical hazards; revised labeling provisions for small containers and packages that have been released for shipment; revised trade secret disclosure requirements; updates to certain aspects of SDSs and precautionary statements; and related revisions to definitions of terms used in the standard.

In this section, OSHA presents a preliminary profile of industries affected by this proposal to revise the HCS. The profile data in this section are based upon the 2012 HCS final economic analysis (FEA), updated in this PEA with the most recent data available.

As a first step, OSHA identifies the North American Industry Classification System (NAICS) industries affected by the proposed changes to the HCS. Next, OSHA provides statistical information on the affected industries, including the number of affected entities and establishments; the number of workers whose exposure to the chemicals subject to the HCS could result in injury, illness, or death (“affected relevant employees”); and the average revenues and profits for affected entities and establishments by six-digit NAICS industry.¹² This information is provided for each affected industry as a whole, as well as for small entities, as defined by the Small Business Administration (SBA), and for “very small” entities, defined by OSHA as those with fewer than 20 employees, in each affected industry (U.S. Census Bureau, 2020a, Document ID 0231; U.S. Census Bureau, 2020b, Document ID 0232).

The revisions to the HCS would affect establishments in a variety of different industries in which employees are exposed to hazardous chemicals or in which hazardous chemicals are produced. The proposed changes to the HCS are not expected to change the overall list of affected industries or establishments. However, the changes are expected to affect certain establishment groupings that manufacture aerosols, desensitized explosives, and flammable gases. These proposed changes are also expected to affect certain manufacturers of hazardous chemicals that are packaged in small containers and manufacturers of chemicals that are not immediately distributed after being released for shipment.

The proposed revisions define and revise specific classifications and categories of hazards, but the scope of the requirements under which a chemical (whether a substance or mixture of substances) becomes subject to the standard is not substantially different from the current version of the HCS. Therefore, OSHA believes that the revisions would have little or no effect on whether specific establishments fall within the scope of the standard. OSHA

¹² The Census Bureau defines an establishment as a single physical location at which business is conducted or services or industrial operations are performed. The Census Bureau defines a business firm or entity as a business organization consisting of one or more domestic establishments in the same state and industry that are specified under common ownership or control. The firm and the establishment are the same for single-establishment firms. For each multi-establishment firm, establishments in the same industry within a state will be counted as one firm; the firm employment and annual payroll are summed from the associated establishments. (U.S. Census Bureau, Document ID 0047).

requests comments on its preliminary determinations about the scope of the proposed revisions to the HCS and the details within the industrial profile presented in this section.

OSHA’s estimates of the number of employees who will require new training under the proposed revisions to the standard are based on BLS’ (2020) Occupational Employment Statistics data for May 2019, specifically the estimates of the number of employees in SOC 51–0000 Production Occupations and SOC 13–1081 Logisticians working in firms in the NAICS industries that would be affected by the proposed requirements to reclassify aerosols, desensitized explosives, and flammable gases.¹³ (See the analysis and discussion of training costs below in VII.F. Compliance Costs and Cost Savings.)

Table VII–1 provides an overview of the estimated numbers of firms, establishments, and employees in each covered NAICS industry; the estimated number of employees in covered occupations (e.g., logistics personnel); and the estimated numbers of affected firms, affected establishments, and affected employees in covered occupations.¹⁴ Tables VII–2 and VII–3, respectively, provide parallel information for all affected business entities defined as small by the SBA¹⁵ and all affected very small business entities, defined by OSHA as those with fewer than 20 employees. The data in

¹³ The NAICS industries estimated to be affected by the proposed requirement to reclassify aerosols, desensitized explosives, and flammable gases are the following: 211130 Natural Gas Extraction, 324110 Petroleum Refineries, 325110 Petrochemical Manufacturing, 325120 Industrial Gas Manufacturing, 325320 Pesticide and Other Agricultural Chemical Manufacturing, 325412 Pharmaceutical Preparation Manufacturing, 325510 Paint and Coating Manufacturing, 325520 Adhesive Manufacturing, 325611 Soap and Other Detergent Manufacturing, 325612 Polish and Other Sanitation Good Manufacturing, 325613 Surface Active Agent Manufacturing, 325620 Toilet Preparation Manufacturing, and 325920 Explosives Manufacturing. Bureau of Labor Statistics (BLS, 2020). Occupational Employment Statistics—May 2019 (Released March 3, 2020). Available at <https://www.bls.gov/oes/#data> (Accessed April 3, 2020) (Document ID 0223).

¹⁴ The overall percentage of firms, establishments, or employees affected is based on the largest percentage affected for any single cost item—as shown in Table VI–10 later in this section. To estimate the overall number of affected firms, establishments, and employees, OSHA multiplied the total number of firms, establishments, and employees by the maximum percentage of firms, establishments, and/or employees affected by any single provision. Because most of the NAICS industries shown in the table would be affected by rule familiarization, this percentage is 100 percent for most of the NAICS industries shown.

¹⁵ For the 2019 SBA U.S. Small Business Administration Table of Small Business Size Standards matched to North American Industry Classification System Codes (Effective August 19, 2019), (see SBA, 2019, Document ID 0225).

these tables update the estimates provided in the FEA in support of the 2012 HCS final rule (Document ID 0005, Section VI) and rely on the most recent comprehensive set of data (including

revenues) available from the U.S. Census Bureau (2020a; 2020b).¹⁶

¹⁶ U.S. Census Bureau, Statistics of U.S. Businesses, 2017 <https://www.census.gov/data/>

[tables/2017/econ/susb/2017-susb-annual.html](https://www.census.gov/data/datasets/2017/econ/susb/2017-susb-annual.html) (Document ID 0231) and <https://www.census.gov/data/datasets/2017/econ/susb/2017-susb.html> (Document ID 0232) (accessed August 14, 2020).

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Table VII-1: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - All Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
21	Mining, Quarrying, and Oil and Gas Extraction	15,427	19,150	394,604	23,203	5,200	6,405	7,389
211	Oil and Gas Extraction	5,200	6,405	108,985	7,389	5,200	6,405	7,389
211120	Crude Petroleum Extraction	4,570	5,333	85,169	5,774	4,570	5,333	5,774
211130	Natural Gas Extraction	630	1,072	23,816	1,615	630	1,072	1,615
31-33	Manufacturing	258,563	290,936	11,721,785	6,111,260	60,752	74,969	1,442,936
324	Petroleum and Coal Products Manufacturing	984	2,135	105,730	44,261	984	2,135	44,261
324110	Petroleum Refineries	70	155	63,594	26,622	70	155	26,622
324121	Asphalt Paving Mixture and Block Manufacturing	472	1,361	15,991	6,694	472	1,361	6,694
324122	Asphalt Shingle and Coating Materials Manufacturing	123	217	10,662	4,463	123	217	4,463
324191	Petroleum Lubricating Oil and Grease Manufacturing	253	318	12,462	5,217	253	318	5,217
324199	All Other Petroleum and Coal Products Manufacturing	66	84	3,021	1,265	66	84	1,265
325	Chemical Manufacturing	10,389	13,426	784,725	289,832	10,389	13,426	289,832
325110	Petrochemical Manufacturing	28	44	9,369	3,727	28	44	3,727
325120	Industrial Gas Manufacturing	63	502	13,202	5,251	63	502	5,251
325130	Synthetic Dye and Pigment Manufacturing	112	146	8,963	3,565	112	146	3,565
325180	Other Basic Inorganic Chemical Manufacturing	363	626	39,878	15,861	363	626	15,861
325193	Ethyl Alcohol Manufacturing	121	210	11,276	4,485	121	210	4,485
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	53	78	6,079	2,418	53	78	2,418
325199	All Other Basic Organic Chemical Manufacturing	591	814	67,603	26,889	591	814	26,889
325211	Plastics Material and Resin Manufacturing	852	1,125	75,998	30,228	852	1,125	30,228
325212	Synthetic Rubber Manufacturing	140	154	9,661	3,842	140	154	3,842
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	109	132	14,220	5,656	109	132	5,656
325311	Nitrogenous Fertilizer Manufacturing	163	202	6,154	2,448	163	202	2,448
325312	Phosphatic Fertilizer Manufacturing	45	71	5,279	2,099	45	71	2,099
325314	Fertilizer (Mixing Only) Manufacturing	359	473	8,625	3,430	359	473	3,430
325320	Pesticide and Other Agricultural Chemical Manufacturing	188	229	10,798	4,295	188	229	4,295
325411	Medicinal and Botanical Manufacturing	451	492	27,160	8,381	451	492	8,381
325412	Pharmaceutical Preparation Manufacturing	1,007	1,280	147,442	45,497	1,007	1,280	45,497
325413	In-Vitro Diagnostic Substance Manufacturing	192	237	28,838	8,898	192	237	8,898
325414	Biological Product (except Diagnostic) Manufacturing	266	341	46,498	14,348	266	341	14,348
325510	Paint and Coating Manufacturing	998	1,197	39,139	15,567	998	1,197	15,567
325520	Adhesive Manufacturing	403	559	24,231	9,638	403	559	9,638

Table VII-1: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - All Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees (a)	Employees in Covered Occupations (a)	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
325611	Soap and Other Detergent Manufacturing	618	675	25,387	10,097	618	675	10,097
325612	Polish and Other Sanitation Good Manufacturing	419	458	15,779	6,276	419	458	6,276
325613	Surface Active Agent Manufacturing	105	131	5,938	2,362	105	131	2,362
325620	Toilet Preparation Manufacturing	926	984	53,817	21,405	926	984	21,405
325910	Printing Ink Manufacturing	182	342	10,962	4,360	182	342	4,360
325920	Explosives Manufacturing	52	88	7,288	2,899	52	88	2,899
325991	Custom Compounding of Purchased Resins	330	402	19,529	7,768	330	402	7,768
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	189	204	8,712	3,465	189	204	3,465
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	1,064	1,230	36,900	14,677	1,064	1,230	14,677
326	Plastics and Rubber Products Manufacturing	9,694	12,217	771,836	468,018	9,694	12,217	468,018
326111	Plastics Bag and Pouch Manufacturing	271	339	31,188	18,528	271	339	18,528
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	299	396	33,748	20,049	299	396	20,049
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	429	529	35,951	21,358	429	529	21,358
326121	Unlaminated Plastics Profile Shape Manufacturing	326	375	20,033	11,901	326	375	11,901
326122	Plastics Pipe and Pipe Fitting Manufacturing	266	448	23,281	13,831	266	448	13,831
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	208	230	12,378	7,354	208	230	7,354
326140	Polyethylene Foam Product Manufacturing	308	438	26,968	16,021	308	438	16,021
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	445	653	32,428	19,265	445	653	19,265
326160	Plastics Bottle Manufacturing	195	470	31,243	18,560	195	470	18,560
326191	Plastics Plumbing Fixture Manufacturing	311	346	17,300	10,278	311	346	10,278
326199	All Other Plastics Product Manufacturing	5,187	6,156	374,862	222,698	5,187	6,156	222,698
326211	Tire Manufacturing (except Retreading)	81	114	45,509	30,294	81	114	30,294
326212	Tire Retreading	261	373	6,568	4,372	261	373	4,372
326220	Rubber and Plastics Hoses and Belting Manufacturing	196	273	19,713	13,123	196	273	13,123
326291	Rubber Product Manufacturing for Mechanical Use	346	411	30,895	20,567	346	411	20,567
326299	All Other Rubber Product Manufacturing	565	666	29,771	19,819	565	666	19,819
327	Nonmetallic Mineral Product Manufacturing	9,636	15,126	392,588	152,192	9,636	15,126	152,192
327110	Pottery, Ceramics, and Plumbing Fixture Manufacturing	566	585	12,508	4,849	566	585	4,849
327120	Clay Building Material and Refractories Manufacturing	375	530	21,628	8,385	375	530	8,385
327211	Flat Glass Manufacturing	74	98	11,504	4,459	74	98	4,459

Table VII-1: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - All Entities

NALCS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
327212	Other Pressed and Blown Glass and Glassware Manufacturing	387	410	13,501	5,234	387	410	5,234
327213	Glass Container Manufacturing	29	69	14,426	5,593	29	69	5,593
327215	Glass Product Manufacturing Made of Purchased Glass	983	1,119	53,450	20,720	983	1,119	20,720
327310	Cement Manufacturing	101	215	14,121	5,475	101	215	5,475
327320	Ready-Mix Concrete Manufacturing	2,098	5,747	80,802	31,324	2,098	5,747	31,324
327331	Concrete Block and Brick Manufacturing	430	686	16,575	6,426	430	686	6,426
327332	Concrete Pipe Manufacturing	98	240	5,958	2,309	98	240	2,309
327390	Other Concrete Product Manufacturing	1,560	1,903	54,904	21,284	1,560	1,903	21,284
327410	Lime Manufacturing	38	95	4,225	1,638	38	95	1,638
327420	Gypsum Product Manufacturing	127	202	9,618	3,729	127	202	3,729
327910	Abrasive Product Manufacturing	256	301	12,639	4,900	256	301	4,900
327991	Cut Stone and Stone Product Manufacturing	1,907	1,982	31,577	12,241	1,907	1,982	12,241
327992	Ground or Treated Mineral and Earth Manufacturing	154	257	7,986	3,096	154	257	3,096
327993	Mineral Wool Manufacturing	174	264	14,842	5,753	174	264	5,753
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	279	423	12,324	4,777	279	423	4,777
331	Primary Metal Manufacturing	3,558	4,287	370,534	213,151	3,558	4,287	213,151
331110	Iron and Steel Mills and Ferroalloy Manufacturing	369	522	93,552	44,565	369	522	44,565
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	180	241	23,495	13,100	180	241	13,100
331221	Rolled Steel Shape Manufacturing	170	204	8,126	4,531	170	204	4,531
331222	Steel Wire Drawing	210	252	14,585	8,133	210	252	8,133
331313	Alumina Refining and Primary Aluminum Production	31	41	4,224	2,314	31	41	2,314
331314	Secondary Smelting and Alloying of Aluminum	65	87	5,338	2,924	65	87	2,924
331315	Aluminum Sheet, Plate, and Foil Manufacturing	62	90	18,759	10,277	62	90	10,277
331318	Other Aluminum Rolling, Drawing, and Extruding	212	275	29,441	16,129	212	275	16,129
331410	Nonferrous Metal (except Aluminum) Smelting and Refining	129	146	7,908	4,332	129	146	4,332
331420	Copper Rolling, Drawing, Extruding, and Alloying	164	247	24,375	13,354	164	247	13,354
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	227	255	15,488	8,486	227	255	8,486
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	183	220	9,305	5,098	183	220	5,098
331511	Iron Foundries	298	346	32,738	22,564	298	346	22,564
331512	Steel Investment Foundries	95	114	12,986	8,950	95	114	8,950

Table VII-1: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - All Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
331513	Steel Foundries (except Investment)	189	201	11,581	7,982	189	201	7,982
331523	Nonferrous Metal Die-Casting Foundries	351	396	33,674	23,209	351	396	23,209
331524	Aluminum Foundries (except Die-Casting)	371	390	14,593	10,058	371	390	10,058
331529	Other Nonferrous Metal Foundries (except Die-Casting)	252	260	10,366	7,145	252	260	7,145
339	Miscellaneous Manufacturing	26,491	27,778	545,724	275,482	26,491	27,778	275,482
339112	Surgical and Medical Instrument Manufacturing	1,063	1,234	109,121	55,410	1,063	1,234	55,410
339113	Surgical Appliance and Supplies Manufacturing	1,651	1,867	86,837	44,095	1,651	1,867	44,095
339114	Dental Equipment and Supplies Manufacturing	557	579	15,040	7,637	557	579	7,637
339115	Ophthalmic Goods Manufacturing	336	493	25,411	12,904	336	493	12,904
339116	Dental Laboratories	5,637	5,971	41,838	21,245	5,637	5,971	21,245
339910	Jewelry and Silverware Manufacturing	1,967	1,986	23,813	14,153	1,967	1,986	14,153
339920	Sporting and Athletic Goods Manufacturing	1,586	1,649	39,326	19,373	1,586	1,649	19,373
339930	Doll, Toy, and Game Manufacturing	503	509	6,120	3,015	503	509	3,015
339940	Office Supplies (except Paper) Manufacturing	423	449	11,689	5,758	423	449	5,758
339950	Sign Manufacturing	5,602	5,727	76,353	37,615	5,602	5,727	37,615
339991	Gasket, Packing, and Sealing Device Manufacturing	490	562	28,575	14,078	490	562	14,078
339992	Musical Instrument Manufacturing	585	606	11,412	5,622	585	606	5,622
339993	Fastener, Button, Needle, and Pin Manufacturing	103	110	3,992	1,966	103	110	1,966
339994	Broom, Brush, and Mop Manufacturing	168	184	9,748	4,802	168	184	4,802
339995	Burial Casket Manufacturing	82	97	3,514	1,731	82	97	1,731
339999	All Other Miscellaneous Manufacturing	5,738	5,755	52,935	26,078	5,738	5,755	26,078
42	Wholesale Trade	266,333	369,466	5,824,018	332,642	49,806	71,053	60,455
423	Merchant Wholesalers, Durable Goods	168,238	239,812	3,460,468	193,962	13,697	19,588	15,604
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	7,886	10,125	223,659	8,539	7,886	10,125	8,539
423840	Industrial Supplies Merchant Wholesalers	5,811	9,463	105,490	7,065	5,811	9,463	7,065
424	Merchant Wholesalers, Nondurable Goods	98,095	129,654	2,363,550	138,680	36,109	51,465	44,851
424210	Drugs and Druggists' Sundries Merchant Wholesalers	6,958	10,281	304,606	17,755	6,958	10,281	17,755
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers	2,218	2,968	33,302	1,941	2,218	2,968	1,941
424690	Other Chemical and Allied Products Merchant Wholesalers	6,069	9,418	126,009	7,345	6,069	9,418	7,345
424710	Petroleum Bulk Stations and Terminals	2,334	3,950	66,261	3,862	2,334	3,950	3,862
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	1,857	2,463	33,558	1,956	1,857	2,463	1,956

Table VII-1: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - All Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
424910	Farm Supplies Merchant Wholesalers	4,965	9,216	107,655	6,275	4,965	9,216	6,275
424950	Paint, Varnish, and Supplies Merchant Wholesalers	1,012	1,916	20,851	1,216	1,012	1,916	1,216
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	10,696	11,253	77,225	4,501	10,696	11,253	4,501
Total		6,077,430	7,780,863	148,004,068	9,637,950	115,758	152,427	1,510,780

Sources: U.S. Census Bureau, 2020a (Document ID 0231); U.S. Census Bureau, 2020b (Document ID 0232); U.S. Census Bureau, 2019a (Document ID 0227); BLS, 2020 (Document ID 0223); U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

Note: Figures may not add to totals due to rounding.

Note: "Affected" firms, establishments, employees, labels, and SDSs are based on the maximum number affected by any one provision of the rule.

[a] Figures in these columns for two-digit and three-digit NAICS codes represent totals for the entire industry at the specified level and may exceed the total sum of the data for the affected six-digit NAICS industries that fall within the aggregated levels. This occurs because two-digit and three-digit NAICS codes may encompass some six-digit NAICS industries not covered by OSHA. (For example, NAICS 21 encompasses Mining, which is not covered by OSHA regulations.)

Table VII-2: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - Small Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
21	Mining, Quarrying, and Oil and Gas Extraction	13,480	14,512	19,094	1,230	5,111	5,529	940
211	Oil and Gas Extraction	5,111	5,529	13,852	940	5,111	5,529	940
211120	Crude Petroleum Extraction	4,519	4,842	11,392	773	4,519	4,842	773
211130	Natural Gas Extraction	592	687	2,460	167	592	687	167
31-33	Manufacturing	160,080	168,058	574,144	298,937	35,641	39,115	83,501
324	Petroleum and Coal Products Manufacturing	488	728	4,238	1,775	488	728	1,775
324110	Petroleum Refineries	8	10	3,579	1,499	8	10	1,499
324121	Asphalt Paving Mixture and Block Manufacturing	422	644	0	0	422	644	0
324191	Petroleum Lubricating Oil and Grease Manufacturing	4	9	659	276	4	9	276
324199	All Other Petroleum and Coal Products Manufacturing	54	65	0	0	54	65	0
325	Chemical Manufacturing	5,729	6,345	52,927	19,145	5,729	6,345	19,145
325110	Petrochemical Manufacturing	3	4	754	299	3	4	299
325130	Synthetic Dye and Pigment Manufacturing	5	7	1,259	501	5	7	501
325180	Other Basic Inorganic Chemical Manufacturing	24	48	3,138	1,248	24	48	1,248
325193	Ethyl Alcohol Manufacturing	3	4	97	39	3	4	39
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	37	38	282	113	37	38	113
325199	All Other Basic Organic Chemical Manufacturing	515	576	6,356	2,528	515	576	2,528
325211	Plastics Material and Resin Manufacturing	771	881	8,359	3,325	771	881	3,325
325311	Nitrogenous Fertilizer Manufacturing	3	6	140	56	3	6	56
325312	Phosphatic Fertilizer Manufacturing	5	7	110	44	5	7	44
325314	Fertilizer (Mixing Only) Manufacturing	340	409	0	0	340	409	0
325411	Medicinal and Botanical Manufacturing	8	10	2,858	882	8	10	882
325412	Pharmaceutical Preparation Manufacturing	930	988	14,680	4,530	930	988	4,530
325413	In-Vitro Diagnostic Substance Manufacturing	167	179	289	90	167	179	90
325414	Biological Product (except Diagnostic) Manufacturing	221	243	3,577	1,104	221	243	1,104
325510	Paint and Coating Manufacturing	17	38	2,819	1,121	17	38	1,121
325520	Adhesive Manufacturing	350	387	0	0	350	387	0
325612	Polish and Other Sanitation Good Manufacturing	4	4	301	120	4	4	120
325620	Toilet Preparation Manufacturing	896	924	7,113	2,829	896	924	2,829
325910	Printing Ink Manufacturing	161	243	0	0	161	243	0
325991	Custom Compounding of Purchased Resins	292	312	0	0	292	312	0
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	3	9	794	316	3	9	316
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	974	1,028	0	0	974	1,028	0
326	Plastics and Rubber Products Manufacturing	1,543	1,883	52,045	31,437	1,543	1,883	31,437
326111	Plastics Bag and Pouch Manufacturing	5	9	2,026	1,204	5	9	1,204

Table VII-2: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - Small Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	8	15	2,375	1,411	8	15	1,411
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	11	22	2,718	1,615	11	22	1,615
326121	Unlaminated Plastics Profile Shape Manufacturing	286	309	0	0	286	309	0
326122	Plastics Pipe and Pipe Fitting Manufacturing	3	12	720	428	3	12	428
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	177	186	0	0	177	186	0
326140	Polystyrene Foam Product Manufacturing	8	26	2,469	1,467	8	26	1,467
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	11	20	2,081	1,237	11	20	1,237
326160	Plastics Bottle Manufacturing	183	246	3,706	2,201	183	246	2,201
326191	Plastics Plumbing Fixture Manufacturing	5	14	1,955	1,161	5	14	1,161
326199	All Other Plastics Product Manufacturing	73	141	26,775	15,906	73	141	15,906
326211	Tire Manufacturing (except Retreading)	3	4	3,064	2,040	3	4	2,040
326212	Tire Retreading	245	283	0	0	245	283	0
326220	Rubber and Plastics Hoses and Belting Manufacturing	7	12	1,633	1,087	7	12	1,087
326291	Rubber Product Manufacturing for Mechanical Use	7	12	2,523	1,680	7	12	1,680
326299	All Other Rubber Product Manufacturing	511	572	0	0	511	572	0
327	Nonmetallic Mineral Product Manufacturing	6,636	8,532	10,294	3,991	6,636	8,532	3,991
327110	Pottery, Ceramics, and Plumbing Fixture Manufacturing	4	6	1,452	563	4	6	563
327120	Clay Building Material and Refractories Manufacturing	7	30	2,182	846	7	30	846
327212	Other Pressed and Blown Glass and Glassware Manufacturing	372	379	1,387	538	372	379	538
327213	Glass Container Manufacturing	21	25	0	0	21	25	0
327215	Glass Product Manufacturing Made of Purchased Glass	7	15	2,422	939	7	15	939
327310	Cement Manufacturing	4	8	775	300	4	8	300
327320	Ready-Mix Concrete Manufacturing	2,038	3,492	0	0	2,038	3,492	0
327331	Concrete Block and Brick Manufacturing	401	514	0	0	401	514	0
327332	Concrete Pipe Manufacturing	3	16	583	226	3	16	226
327390	Other Concrete Product Manufacturing	1,511	1,659	0	0	1,511	1,659	0
327410	Line Manufacturing	3	13	846	328	3	13	328
327991	Cut Stone and Stone Product Manufacturing	1,886	1,929	0	0	1,886	1,929	0
327992	Ground or Treated Mineral and Earth Manufacturing	125	160	0	0	125	160	0
327993	Mineral Wool Manufacturing	4	6	647	251	4	6	251
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	250	280	0	0	250	280	0
331	Primary Metal Manufacturing	1,219	1,327	30,252	16,037	1,219	1,327	16,037
331110	Iron and Steel Mills and Ferroalloy Manufacturing	26	54	13,461	6,413	26	54	6,413
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	11	28	3,431	1,913	11	28	1,913
331221	Rolled Steel Shape Manufacturing	7	7	642	358	7	7	358

Table VII-2: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS - Small Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
331222	Steel Wire Drawing	9	25	3,108	1,733	9	25	1,733
331315	Aluminum Sheet, Plate, and Foil Manufacturing	49	55	0	0	49	55	0
331318	Other Aluminum Rolling, Drawing, and Extruding	8	14	2,439	1,336	8	14	1,336
331410	Nonferrous Metal (except Aluminum) Smelting and Refining	5	9	1,066	584	5	9	584
331420	Copper Rolling, Drawing, Extruding, and Alloying	7	11	2,507	1,374	7	11	1,374
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	3	3	533	292	3	3	292
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	3	3	550	301	3	3	301
331511	Iron Foundries	3	3	309	213	3	3	213
331512	Steel Investment Foundries	6	9	2,206	1,520	6	9	1,520
331513	Steel Foundries (except Investment)	172	176	0	0	172	176	0
331523	Nonferrous Metal Die-Casting Foundries	315	323	0	0	315	323	0
331524	Aluminum Foundries (except Die-Casting)	359	367	0	0	359	367	0
331529	Other Nonferrous Metal Foundries (except Die-Casting)	236	240	0	0	236	240	0
339	Miscellaneous Manufacturing	20,026	20,300	22,091	11,116	20,026	20,300	11,116
339112	Surgical and Medical Instrument Manufacturing	26	52	9,980	5,068	26	52	5,068
339113	Surgical Appliance and Supplies Manufacturing	10	13	2,802	1,422	10	13	1,422
339114	Dental Equipment and Supplies Manufacturing	5	10	1,593	809	5	10	809
339115	Ophthalmic Goods Manufacturing	4	16	1,062	539	4	16	539
339116	Dental Laboratories	5,623	5,682	0	0	5,623	5,682	0
339910	Jewelry and Silverware Manufacturing	1,954	1,964	0	0	1,954	1,964	0
339920	Sporting and Athletic Goods Manufacturing	9	21	3,351	1,651	9	21	1,651
339930	Doll, Toy, and Game Manufacturing	498	503	0	0	498	503	0
339940	Office Supplies (except Paper) Manufacturing	6	7	1,089	536	6	7	536
339950	Sign Manufacturing	5,571	5,668	0	0	5,571	5,668	0
339991	Gasket, Packing, and Sealing Device Manufacturing	450	469	0	0	450	469	0
339992	Musical Instrument Manufacturing	3	10	2,214	1,091	3	10	1,091
339994	Broom, Brush, and Mop Manufacturing	153	160	0	0	153	160	0
339999	All Other Miscellaneous Manufacturing	5,714	5,725	0	0	5,714	5,725	0
42	Wholesale Trade	255,199	276,509	332,271	18,450	47,541	51,142	3,452
423	Merchant Wholesalers, Durable Goods	161,160	176,375	179,042	9,549	13,098	13,961	439
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	7,652	7,886	11,502	439	7,652	7,886	439
423840	Industrial Supplies Merchant Wholesalers	5,446	6,075	0	0	5,446	6,075	0
424	Merchant Wholesalers, Nondurable Goods	94,039	100,134	153,229	8,901	34,443	37,181	3,013
424210	Drugs and Druggists' Sundries Merchant Wholesalers	6,663	6,938	23,039	1,343	6,663	6,938	1,343

Table VII-2: Characteristics of Industries Affected by OSHA's Proposed Revisions to the IICS - Small Entities

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers	2,090	2,325	2,408	140	2,090	2,325	140
424690	Other Chemical and Allied Products Merchant Wholesalers	5,760	6,274	5,505	321	5,760	6,274	321
424710	Petroleum Bulk Stations and Terminals	2,086	2,533	8,163	476	2,086	2,533	476
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	1,691	1,808	3,913	228	1,691	1,808	228
424910	Farm Supplies Merchant Wholesalers	4,777	5,564	7,612	444	4,777	5,564	444
424950	Paint, Varnish, and Supplies Merchant Wholesalers	958	1,157	1,050	61	958	1,157	61
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	10,418	10,582	0	0	10,418	10,582	0
Total		5,820,799	6,165,382	9,714,667	496,344	88,293	95,786	87,893

Sources: U.S. Census Bureau, 2020a (Document ID 0231); U.S. Census Bureau, 2020b (Document ID 0232); U.S. Census Bureau, 2019a (Document ID 0227); BLS, 2020 (Document ID 0223); U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

Note: Figures may not add to totals due to rounding.

Note: "Affected" firms, establishments, employees, labels, and SDSs are based on the maximum number affected by any one provision of the rule.

[a] Figures in these columns for two-digit and three-digit NAICS codes represent totals for the entire industry at the specified level and may exceed the total sum of the data for the affected six-digit NAICS industries that fall within the aggregated levels. This occurs because two-digit and three-digit NAICS codes may encompass some six-digit NAICS industries not covered by OSHA. (For example, NAICS 21 encompasses Mining, which is not covered by OSHA regulations.)

Table VII-3: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS – Entities With <20 Employees

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees (a)	Employees in Covered Occupations (a)	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
21	Mining, Quarrying, and Oil and Gas Extraction	13,018	13,092	48,895	2,897	4,573	4,603	1,031
211	Oil and Gas Extraction	4,573	4,603	15,204	1,031	4,573	4,603	1,031
211120	Crude Petroleum Extraction	4,112	4,137	13,048	885	4,112	4,137	885
211130	Natural Gas Extraction	461	466	2,156	146	461	466	146
31-33	Manufacturing	185,713	186,202	1,005,403	540,919	42,571	42,735	105,843
324	Petroleum and Coal Products Manufacturing	482	488	2,827	1,183	482	488	1,183
324110	Petroleum Refineries	11	11	67	28	11	11	28
324121	Asphalt Paving Mixture and Block Manufacturing	233	238	1,340	561	233	238	561
324122	Asphalt Shingle and Coating Materials Manufacturing	67	67	373	156	67	67	156
324191	Petroleum Lubricating Oil and Grease Manufacturing	134	134	887	371	134	134	371
324199	All Other Petroleum and Coal Products Manufacturing	37	38	160	67	37	38	67
325	Chemical Manufacturing	6,028	6,048	34,076	13,044	6,028	6,048	13,044
325110	Petrochemical Manufacturing	7	7	63	25	7	7	25
325120	Industrial Gas Manufacturing	39	39	231	92	39	39	92
325130	Synthetic Dye and Pigment Manufacturing	58	58	282	113	58	58	113
325180	Other Basic Inorganic Chemical Manufacturing	146	146	923	367	146	146	367
325193	Ethyl Alcohol Manufacturing	18	19	87	34	18	19	34
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	20	20	124	50	20	20	50
325199	All Other Basic Organic Chemical Manufacturing	260	261	1,676	667	260	261	667
325211	Plastics Material and Resin Manufacturing	349	349	2,542	1,012	349	349	1,012
325212	Synthetic Rubber Manufacturing	64	64	360	143	64	64	143
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	40	40	281	112	40	40	112
325311	Nitrogenous Fertilizer Manufacturing	101	101	532	212	101	101	212
325312	Phosphatic Fertilizer Manufacturing	11	11	73	29	11	11	29
325314	Fertilizer (Mixing Only) Manufacturing	235	237	1,401	557	235	237	557
325320	Pesticide and Other Agricultural Chemical Manufacturing	116	118	493	196	116	118	196
325411	Medicinal and Botanical Manufacturing	271	271	1,542	476	271	271	476
325412	Pharmaceutical Preparation Manufacturing	579	584	2,929	903	579	584	903
325413	In-Vitro Diagnostic Substance Manufacturing	91	93	495	153	91	93	153
325414	Biological Product (except Diagnostic) Manufacturing	136	136	773	238	136	136	238
325510	Paint and Coating Manufacturing	683	686	4,198	1,670	683	686	1,670
325520	Adhesive Manufacturing	214	214	1,379	549	214	214	549
325611	Soap and Other Detergent Manufacturing	454	454	2,387	950	454	454	950
325612	Polish and Other Sanitation Good Manufacturing	291	291	1,576	627	291	291	627

Table VII-3: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS – Entities With <20 Employees

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees (a)	Employees in Covered Occupations (a)	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
325613	Surface Active Agent Manufacturing	59	59	320	127	59	59	127
325620	Toilet Preparation Manufacturing	623	624	3,069	1,221	623	624	1,221
325910	Printing Ink Manufacturing	111	111	737	293	111	111	293
325920	Explosives Manufacturing	19	19	146	58	19	19	58
325991	Custom Compounding of Purchased Resins	179	179	1,207	480	179	179	480
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	143	145	585	232	143	145	232
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	711	712	3,665	1,458	711	712	1,458
326	Plastics and Rubber Products Manufacturing	5,073	5,078	33,115	20,015	5,073	5,078	20,015
326111	Plastics Bag and Pouch Manufacturing	112	114	783	465	112	114	465
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	101	102	710	422	101	102	422
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	215	215	1,271	755	215	215	755
326121	Unlaminated Plastics Profile Shape Manufacturing	148	148	902	536	148	148	536
326122	Plastics Pipe and Pipe Fitting Manufacturing	115	115	778	462	115	115	462
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	113	113	698	415	113	113	415
326140	Polystyrene Foam Product Manufacturing	145	145	963	572	145	145	572
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	208	208	1,492	886	208	208	886
326160	Plastics Bottle Manufacturing	66	66	418	248	66	66	248
326191	Plastics Plumbing Fixture Manufacturing	182	182	1,374	816	182	182	816
326199	All Other Plastics Product Manufacturing	2,904	2,906	18,940	11,252	2,904	2,906	11,252
326211	Tire Manufacturing (except Retreading)	38	38	182	121	38	38	121
326212	Tire Retreading	156	156	979	652	156	156	652
326220	Rubber and Plastics Hoses and Belting Manufacturing	104	104	529	352	104	104	352
326291	Rubber Product Manufacturing for Mechanical Use	162	162	1,150	765	162	162	765
326299	All Other Rubber Product Manufacturing	304	304	1,946	1,296	304	304	1,296
327	Nonmetallic Mineral Product Manufacturing	6,513	6,589	39,366	15,256	6,513	6,589	15,256
327110	Pottery, Ceramics, and Plumbing Fixture Manufacturing	462	462	1,821	706	462	462	706
327120	Clay Building Material and Refractories Manufacturing	199	199	1,194	462	199	199	462
327211	Flat Glass Manufacturing	29	29	138	53	29	29	53
327212	Other Pressed and Blown Glass and Glassware Manufacturing	312	313	1,392	540	312	313	540
327213	Glass Container Manufacturing	13	13	68	26	13	13	26
327215	Glass Product Manufacturing Made of Purchased Glass	736	737	3,309	1,283	736	737	1,283
327310	Cement Manufacturing	54	56	291	112	54	56	112
327320	Ready-Mix Concrete Manufacturing	1,275	1,325	9,138	3,542	1,275	1,325	3,542

Table VII-3: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS – Entities With <20 Employees

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
327331	Concrete Block and Brick Manufacturing	241	245	1,773	687	241	245	687
327332	Concrete Pipe Manufacturing	47	47	350	135	47	47	135
327390	Other Concrete Product Manufacturing	1,018	1,022	6,776	2,626	1,018	1,022	2,626
327410	Lime Manufacturing	17	18	111	43	17	18	43
327420	Gypsum Product Manufacturing	98	98	518	201	98	98	201
327910	Abrasive Product Manufacturing	159	159	1,156	448	159	159	448
327991	Cut Stone and Stone Product Manufacturing	1,506	1,516	9,185	3,560	1,506	1,516	3,560
327992	Ground or Treated Mineral and Earth Manufacturing	70	71	409	159	70	71	159
327993	Mineral Wool Manufacturing	99	99	663	257	99	99	257
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	178	180	1,074	416	178	180	416
331	Primary Metal Manufacturing	1,802	1,806	11,156	6,831	1,802	1,806	6,831
331110	Iron and Steel Mills and Ferroalloy Manufacturing	197	197	1,088	518	197	197	518
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	50	50	268	149	50	50	149
331221	Rolled Steel Shape Manufacturing	85	85	518	289	85	85	289
331222	Steel Wire Drawing	113	113	566	316	113	113	316
331313	Alumina Refining and Primary Aluminum Production	12	12	24	13	12	12	13
331314	Secondary Smelting and Alloying of Aluminum	19	19	77	42	19	19	42
331315	Aluminum Sheet, Plate, and Foil Manufacturing	31	31	217	119	31	31	119
331318	Other Aluminum Rolling, Drawing, and Extruding	98	98	572	314	98	98	314
331410	Nonferrous Metal (except Aluminum) Smelting and Refining	76	77	434	238	76	77	238
331420	Copper Rolling, Drawing, Extruding, and Alloying	63	63	447	245	63	63	245
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	141	142	810	444	141	142	444
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	98	100	589	322	98	100	322
331511	Iron Foundries	138	138	932	643	138	138	643
331512	Steel Investment Foundries	26	26	292	201	26	26	201
331513	Steel Foundries (except Investment)	89	89	576	397	89	89	397
331523	Nonferrous Metal Die-Casting Foundries	180	180	1,201	828	180	180	828
331524	Aluminum Foundries (except Die-Casting)	227	227	1,404	967	227	227	967
331529	Other Nonferrous Metal Foundries (except Die-Casting)	159	159	1,141	786	159	159	786
339	Miscellaneous Manufacturing	22,673	22,726	98,204	49,514	22,673	22,726	49,514
339112	Surgical and Medical Instrument Manufacturing	651	651	3,655	1,856	651	651	1,856
339113	Surgical Appliance and Supplies Manufacturing	1,179	1,200	6,567	3,335	1,179	1,200	3,335
339114	Dental Equipment and Supplies Manufacturing	468	469	1,910	970	468	469	970
339115	Ophthalmic Goods Manufacturing	257	257	1,254	637	257	257	637

Table VII-3: Characteristics of Industries Affected by OSHA's Proposed Revisions to the HCS – Entities With <20 Employees

NAICS Code	Industry	Total Firms	Total Establishments	Total Employees [a]	Employees in Covered Occupations [a]	Affected Firms	Affected Establishments	Affected Employees in Covered Occupations
339116	Dental Laboratories	5,294	5,301	18,710	9,501	5,294	5,301	9,501
339910	Jewelry and Silverware Manufacturing	1,763	1,765	6,344	3,771	1,763	1,765	3,771
339920	Sporting and Athletic Goods Manufacturing	1,289	1,293	6,226	3,067	1,289	1,293	3,067
339930	Doll, Toy, and Game Manufacturing	434	434	1,793	884	434	434	884
339940	Office Supplies (except Paper) Manufacturing	328	333	1,751	863	328	333	863
339950	Sign Manufacturing	4,774	4,784	22,211	10,942	4,774	4,784	10,942
339991	Gasket, Packing, and Sealing Device Manufacturing	293	294	2,067	1,018	293	294	1,018
339992	Musical Instrument Manufacturing	504	504	2,217	1,093	504	504	1,093
339993	Fastener, Button, Needle, and Pin Manufacturing	76	76	343	169	76	76	169
339994	Broom, Brush, and Mop Manufacturing	96	96	688	339	96	96	339
339995	Burial Casket Manufacturing	59	60	264	131	59	60	131
339999	All Other Miscellaneous Manufacturing	5,208	5,209	22,204	10,938	5,208	5,209	10,938
42	Wholesale Trade	218,909	221,402	963,936	56,187	41,030	41,674	9,616
423	Merchant Wholesalers, Durable Goods	137,679	140,001	623,928	36,113	11,469	11,624	2,448
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	6,893	6,935	24,628	941	6,893	6,935	941
423840	Industrial Supplies Merchant Wholesalers	4,576	4,689	22,501	1,507	4,576	4,689	1,507
424	Merchant Wholesalers, Nondurable Goods	80,330	81,401	340,008	20,074	29,561	30,050	7,168
424210	Drugs and Druggists' Sundries Merchant Wholesalers	5,661	5,708	23,356	1,361	5,661	5,708	1,361
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers	1,782	1,834	8,416	491	1,782	1,834	491
424690	Other Chemical and Allied Products Merchant Wholesalers	4,967	5,079	21,771	1,269	4,967	5,079	1,269
424710	Petroleum Bulk Stations and Terminals	1,334	1,398	8,878	517	1,334	1,398	517
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	1,301	1,315	5,697	332	1,301	1,315	332
424910	Farm Supplies Merchant Wholesalers	3,985	4,075	18,351	1,070	3,985	4,075	1,070
424950	Paint, Varnish, and Supplies Merchant Wholesalers	803	863	4,120	240	803	863	240
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	9,728	9,778	32,394	1,888	9,728	9,778	1,888
Total		5,305,646	5,348,612	21,017,269	900,039	88,174	89,012	116,490

Sources: U.S. Census Bureau, 2020a (Document ID 02.31); U.S. Census Bureau, 2020b (Document ID 02.32); U.S. Census Bureau, 2019a (Document ID 02.27); BLS, 2020 (Document ID 02.23); U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

Note: Figures may not add to totals due to rounding.

Note: "Affected" firms, establishments, employees, labels, and SDSs are based on the maximum number affected by any one provision of the rule.

[a] Figures in these columns for two-digit and three-digit NAICS codes represent totals for the entire industry at the specified level and may exceed the total sum of the data for the affected six-digit NAICS industries that fall within the aggregated levels. This occurs because two-digit and three-digit NAICS codes may encompass some six-digit NAICS industries not covered by OSHA. (For example, NAICS 21 encompasses Mining, which is not covered by OSHA regulations.)

driven by the number of SDSs (and labels) that manufacturers must redesign as a result of the new criteria and the number of labels on very small containers. In support of the cost analysis to follow later in this PEA, Table VII-4 presents OSHA's preliminary estimate of the number of labels per container by container size

(and type).¹⁷ Starting with the fifth row (container type: 250 ml container), Table VII-4 is drawn from data in a table (Table VI-5) presented in the FEA in support of the 2012 HCS final rule (77 FR 17640), but OSHA has updated the data to include smaller containers to permit evaluation of the impacts of the small container and very small

container labeling provisions proposed in paragraph (f)(12). Also, the term "jug" has been changed to the more generic term "container." The figures in Table VII-4 are slightly different than some of the figures in Table VI-5 of the 2012 FEA due to a change in OSHA's approach to rounding and the reporting of more significant digits.

TABLE VII-4—CHEMICAL CONTAINER ESTIMATED TYPICAL SHIPMENT WEIGHTS

Container type	Estimated shipment weight (lbs.)			Number of labels per container ^a
	Minimum	Typical	Maximum	
3 ml container	0.01	0.01	0.01	1.13
30 ml container	0.06	0.08	0.13	1.13
60 ml container	0.12	0.16	0.26	1.13
125 ml container	0.25	0.33	0.54	1.13
250 ml container	0.50	0.67	1.08	1.13
500 ml container	0.92	1.26	2.08	1.13
1 liter container	1.84	2.51	4.16	1.25
2 liter container	3.57	4.92	8.22	1.25
1 gallon container	6.83	9.38	15.63	1.25
2.5 gallon container	18.00	24.38	40.00	1.50
5 gallon drum	34.95	47.71	78.95	1.00
30 gallon drum	202.00	278.56	466.00	1.00
55 gallon drum	371.00	511.37	855.00	1.00
275 gallon tote	1,830.00	2,531.84	4,250.00	1.00
330 gallon tote	2,196.00	3,038.21	5,100.00	1.00
Tank Truck—5.5k g	34,100.00	48,136.79	82,500.00	0.00
Tank Truck—7.0k g	43,400.00	61,265.00	105,000.00	0.00
Rail Car—20k g	128,805.00	181,825.77	311,625.00	0.00
Rail Car—30k g	186,000.00	262,564.29	450,000.00	0.00
Barge	2,670,774.00	3,770,160.58	6,461,550.00	0.00

^a Assumes 8 units per package for containers smaller than 1 liter, 4 units per package for containers from 1 liter to 1 gallon in volume, and 2 units per package for 2.5-gallon containers.

Source: U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

As will be discussed at greater length below in Section VII.F. Compliance Costs and Cost Savings, it is OSHA's understanding that chemical manufacturers and importers periodically review, revise, and update the electronic templates they use to create SDSs and labels. Changes are made, for example, as information regarding specific hazards becomes available, new information about protective measures is ascertained, or revisions are made to product information and marketing materials. Labels and SDSs are also produced and

modified when products are first introduced to the market or when products change. In this PEA, the terms "electronic templates" and "electronic files" are used interchangeably with, and as proxies for, the term "SDS." All three terms refer to the electronic files that are used to generate SDSs and labels. Table VII-5 provides, by covered NAICS industry, estimates of the total number of labels, the number of labels on very small containers (containers of 3 ml capacity or less), the total number of SDSs, and the number of labels and SDSs affected by the proposed revisions

to the HCS classification criteria. The term "SDS" in the column headers and in the discussion below represents the estimated number of electronic templates (files) that are used to create SDSs and labels. The derivation of these estimates is discussed below. OSHA invites public comment on its understanding about the use of electronic template files to create SDSs and labels.

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¹⁷ As reflected in Table VI-4, OSHA assumes one outer packaging with an additional label for every two 2.5-gallon containers; one outer packaging with

an additional label for every four 1-liter, 2-liter, and 1-gallon containers; and one outer packaging with

an additional label for every eight containers smaller than 1 liter.

Table VII-5: Labels and SDSs Affected by OSHA's Proposed Revisions to the HCS - All Entities

NAICS Code	Industry	Total Labels [a]	Total Labels for Very Small Containers [a]	Total SDSs [a]	Labels Affected by Revision [a]	Affected Labels for Very Small Containers [a]	Affected SDSs [a]
21	Mining, Quarrying, and Oil and Gas Extraction	109,265,032	31,076,423	60,975	109,265,032	0	60,975
211	Oil and Gas Extraction	109,265,032	31,076,423	60,975	109,265,032	0	60,975
211120	Crude Petroleum Extraction	3,541,929	0	45,165	3,541,929	0	45,165
211130	Natural Gas Extraction	105,723,103	31,076,423	15,810	105,723,103	0	15,810
31-33	Manufacturing	869,081,754	116,523,050	1,458,531	851,788,962	25,394,066	1,373,596
324	Petroleum and Coal Products Manufacturing	14,882,436	0	863,711	14,882,436	0	863,711
324110	Petroleum Refineries	14,086,121	0	19,760	14,086,121	0	19,760
324121	Asphalt Paving Mixture and Block Manufacturing	288,308	0	133,225	288,308	0	133,225
324122	Asphalt Shingle and Coating Materials Manufacturing	78,955	0	17,140	78,955	0	17,140
324191	Petroleum Lubricating Oil and Grease Manufacturing	345,015	0	688,691	345,015	0	688,691
324199	All Other Petroleum and Coal Products Manufacturing	84,036	0	4,895	84,036	0	4,895
325	Chemical Manufacturing	822,909,392	116,523,050	470,608	822,909,392	25,394,066	470,608
325110	Petrochemical Manufacturing	84,164,339	24,739,404	4,075	84,164,339	0	4,075
325120	Industrial Gas Manufacturing	14,647,038	4,305,375	4,635	14,647,038	0	4,635
325130	Synthetic Dye and Pigment Manufacturing	11,012,449	3,237,017	3,564	11,012,449	0	3,564
325180	Other Basic Inorganic Chemical Manufacturing	50,242,702	14,768,423	4,744	50,242,702	5,907,369	4,744
325193	Ethyl Alcohol Manufacturing	3,329,934	0	4,955	3,329,934	0	4,955
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	22,604,370	0	3,635	22,604,370	0	3,635
325199	All Other Basic Organic Chemical Manufacturing	120,855,181	35,524,371	29,172	120,855,181	14,209,748	29,172
325211	Plastics Material and Resin Manufacturing	4,515,944	0	104,079	4,515,944	0	104,079
325212	Synthetic Rubber Manufacturing	416,487	0	1,803	416,487	0	1,803
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	1,219,708	0	198	1,219,708	0	198
325311	Nitrogenous Fertilizer Manufacturing	4,450,484	0	262	4,450,484	0	262
325312	Phosphatic Fertilizer Manufacturing	8,644,852	2,541,082	122	8,644,852	0	122
325314	Fertilizer (Mixing Only) Manufacturing	3,552,710	0	3,654	3,552,710	0	3,654
325320	Pesticide and Other Agricultural Chemical Manufacturing	23,587,843	6,933,449	4,939	23,587,843	0	4,939
325411	Medicinal and Botanical Manufacturing	17,371,394	5,106,176	4,735	17,371,394	2,042,471	4,735
325412	Pharmaceutical Preparation Manufacturing	24,482,293	6,471,452	15,930	24,482,293	2,588,581	15,930
325413	In-Vitro Diagnostic Substance Manufacturing	1,897,855	501,664	26,971	1,897,855	200,665	26,971
325414	Biological Product (except Diagnostic) Manufacturing	4,210,917	1,113,080	3,338	4,210,917	445,232	3,338
325510	Paint and Coating Manufacturing	79,598,930	0	77,290	79,598,930	0	77,290
325520	Adhesive Manufacturing	42,641,685	0	29,540	42,641,685	0	29,540
325611	Soap and Other Detergent Manufacturing	38,380,263	11,281,558	16,925	38,380,263	0	16,925
325612	Polish and Other Sanitation Good Manufacturing	17,808,975	0	10,887	17,808,975	0	10,887

Table VII-5: Labels and SDSs Affected by OSHA's Proposed Revisions to the HCS - All Entities

NAICS Code	Industry	Total Labels [a]	Total Labels for Very Small Containers [a]	Total SDSs [a]	Labels Affected by Revision [a]	Affected Labels for Very Small Containers [a]	Affected SDSs [a]
325613	Surface Active Agent Manufacturing	20,727,699	0	5,255	20,727,699	0	5,255
325620	Toilet Preparation Manufacturing	119,801,629	0	18,258	119,801,629	0	18,258
325910	Printing Ink Manufacturing	12,550,924	0	34,737	12,550,924	0	34,737
325920	Explosives Manufacturing	6,873,598	0	2,743	6,873,598	0	2,743
325991	Custom Compounding of Purchased Resins	565,592	0	3,978	565,592	0	3,978
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	19,478,621	0	1,475	19,478,621	0	1,475
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	63,274,976	0	48,515	63,274,976	0	48,515
339	Miscellaneous Manufacturing	13,997,134	0	39,277	13,997,134	0	39,277
339112	Surgical and Medical Instrument Manufacturing	3,710,501	0	2,885	3,710,501	0	2,885
339113	Surgical Appliance and Supplies Manufacturing	3,213,294	0	3,548	3,213,294	0	3,548
339114	Dental Equipment and Supplies Manufacturing	455,499	0	866	455,499	0	866
339115	Ophthalmic Goods Manufacturing	549,159	0	1,302	549,159	0	1,302
339116	Dental Laboratories	446,775	0	7,676	446,775	0	7,676
339910	Jewelry and Silverware Manufacturing	667,355	0	2,369	667,355	0	2,369
339920	Sporting and Athletic Goods Manufacturing	947,796	0	2,431	947,796	0	2,431
339930	Doll, Toy, and Game Manufacturing	152,994	0	644	152,994	0	644
339940	Office Supplies (except Paper) Manufacturing	295,239	0	715	295,239	0	715
339950	Sign Manufacturing	1,174,913	0	7,375	1,174,913	0	7,375
339991	Gasket, Packing, and Sealing Device Manufacturing	670,470	0	1,250	670,470	0	1,250
339992	Musical Instrument Manufacturing	181,405	0	825	181,405	0	825
339993	Fastener, Button, Needle, and Pin Manufacturing	82,942	0	198	82,942	0	198
339994	Broom, Brush, and Mop Manufacturing	263,932	0	395	263,932	0	395
339995	Burial Casket Manufacturing	52,961	0	191	52,961	0	191
339999	All Other Miscellaneous Manufacturing	1,131,899	0	6,607	1,131,899	0	6,607
Total	Total	1,512,219,200	147,599,473	1,519,312	961,053,993	25,394,066	1,434,377

Sources: U.S. Census Bureau, 2020a (Document ID 0231); U.S. Census Bureau, 2020b (Document ID 0232); U.S. Census Bureau, 2019a (Document ID 0227); BLS, 2020 (Document ID 0223); U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

Note: Figures may not add to totals due to rounding.

Note: "Affected" firms, establishments, employees, labels, and SDSs are based on the maximum number affected by any one provision of the rule.

[a] Figures in these columns for two-digit and three-digit NAICS codes represent totals for the entire industry at the specified level and may exceed the total sum of the data for the affected six-digit NAICS industries that fall within the aggregated levels. This occurs because two-digit and three-digit NAICS codes may encompass some six-digit NAICS industries not covered by OSHA. (For example, NAICS 21 encompasses Mining, which is not covered by OSHA regulations.)

the agency's FEA for the 2012 final standard.¹⁸ The analysis started with the number of SDSs per establishment by establishment size, as originally derived in the economic analysis in support of the 2009 proposed HCS rule (Document ID 0029) using a sampling of company websites and the SDSs posted there.¹⁹ The analysis then combined the estimated number of SDSs per establishment by establishment size with the estimated number of establishments to estimate the weighted average number of SDSs per establishment in a given NAICS industry. This estimate was then multiplied by the average number of establishments per firm to estimate the number of SDSs per firm for each NAICS industry. Multiplying by the number of firms per NAICS industry yields the total number of SDSs in each NAICS industry (as shown in Column 5 of Table VII-5). Although OSHA has preliminarily determined that this methodology remains sound, the agency invites public comment on the reasonableness of this methodology for the current analysis.

OSHA's estimate of the number of labels per NAICS industry is constructed using the same methodology developed in the 2012 HCS final rule (Document ID 0005, pp. 17634-17643), but with more recent data. The steps in the analysis, elaborated on below, can be summarized as follows:

- Begin with data on shipment weight by commodity code and shipment weight class.
- Estimate the average weight per container for containers of various sizes.
- Allocate the tons shipped in each shipment weight class for certain sizes of containers.
- Divide the tons shipped by the average container weight to estimate total containers.
- Multiply the containers by the average number of labels per container to estimate total labels.
- Allot the labels among NAICS codes using receipts data.

The label analysis begins with the U.S. Census Bureau and the U.S. Department of Transportation's jointly-produced Commodity Flow Survey (CFS) (U.S. Census Bureau, 2014a, Document ID 0024) data on shipment characteristics by commodity and shipment weight. This dataset includes

the number of tons shipped for a range of shipment weight classes by Standard Classification of Transported Goods (SCTG) code. The number of tons is converted to pounds, and limited to hazardous non-consumer products (*i.e.*, those that would have the HCS labeling).²⁰ This estimate is used in conjunction with another CFS dataset (U.S. Census Bureau, 2014b, Document ID 0030) that has shipment data by NAICS industry (but not by shipment weight) to divide the detailed shipment weight data into shipments coming from manufacturers and distributors.

The next step in the methodology estimated the representative weight per container for a variety of types of containers (ranging in size from a 3-milliliter vial to a rail car) and substances (such as antifreeze, diesel fuel, paint). Using representative substances, OSHA estimated the shipment weight for one container of each size as *Shipment Weight* = (*Product Weight per gallon* × *Container Capacity*) + *Container Weight*. Because of a lack of available data establishing the percentage of products shipped by container type (*i.e.*, the breakdown of the types of products shipped by each container type), the calculation for each product and container type relied on professional judgment (by OSHA and its economic contractor, ERG) to select a "typical" product weight per gallon and container weight for each container type. Next, the analysis estimated shipment weight per container by multiplying the average product weight per gallon times the number of gallons per container, plus the container weight.

To convert the CFS data on tons (or pounds) shipped by container size into a number of containers, the analysis estimated the percentage of each shipment class likely to be shipped in certain sizes of containers. Shipments of lower weights are generally estimated to be shipped in smaller containers, and vice versa. Then the total non-consumer hazardous pounds shipped (from the CFS data) was multiplied by the estimated percentage shipped in each container type to yield the number of non-consumer hazardous pounds in each container type. Finally, the non-consumer hazardous pounds in each container type was divided by the

average weight per container type to yield an estimate of the total number of containers.

To estimate the number of labels that would be used on these containers, the analysis first estimated the average number of labels on a single container for each container size (from Table VII-4 above). As previously noted, these estimates account for the fact that some containers have outer packaging that would require an additional label under this proposed rule (*e.g.*, kits containing containers less than 100 ml where tags and fold out labels are infeasible) or are shipped with several containers grouped into a single outer container with a label. This average number of labels per container for each shipment size class was then multiplied by the number of containers to estimate the total number of labels.

The final step in the analysis was to allocate the number of labels shipped from SCTG codes to NAICS codes. The NAICS-to-SCTG mapping was adapted from the mapping used in the FEA in support of the 2012 HCS final rule analysis, but with NAICS categories updated from 2007 to 2017 categories. U.S. Census (2020a; 2020b) Statistics of U.S. Businesses data was used to estimate each NAICS industry's share of total receipts for the SCTG code with which it corresponds, and then the number of labels in each SCTG was allocated proportionally. (This calculation was performed separately for shipments from manufacturers and from distributors for purposes of estimating cost savings due to the proposed released-for-shipment provision in paragraph (f)(11)). This resulted in the estimated number of labels shown in Column 3 of Table VII-5.²¹

To estimate the number of labels on very small containers (those on containers with a volume capacity of 3 ml or less), the same analysis was performed, but it was limited to containers in that size range. The resulting estimates of the number of

²¹ For example, NAICS 211130—Natural Gas Extraction is categorized as a basic chemicals manufacturer, or Code 20 in the SCTG commodity coding system. Across the range of container types and container weights shown in Table VII-4, the analysis led to an estimate of the total number of labels (474,629,165) required by all SCTG Code 20 manufacturers (see Document ID 0049, tab "Labels per NAICS", cell O11). The percentage of receipts (22.3 percent) for NAICS 211130 relative to total receipts for SCTG Code 20 employers (Document ID 0049, tab "Labels per NAICS", cells N11-P11) was then applied to this total number of labels. The result, shown in Column 3 in Table VII-5, is an estimated 105,723,103 labels for NAICS 211130. Note that multiplying factors may yield a slightly different total due to rounding of the factors in the table (but not in the spreadsheet).

¹⁸ Technical and analytical support for this preliminary economic analysis was provided by Eastern Research Group, Inc. under Contract No. DOL-OPS-16-D-0012.

¹⁹ This methodology was not challenged by commenters during the rulemaking that resulted in the 2012 final rule.

²⁰ The estimated percentages for the transported goods identified as hazardous non-consumer products were presented in the 2012 HCS FEA cost model. See ERG/OSHA, 2012, Document ID 0029). At the time OSHA developed this PEA, the final 2017 CFS data was not yet available. Therefore, 2012 CFS data was the most recent information available. OSHA requests public comments on the estimated percentages for the transported goods identified as hazardous non-consumer products in this preliminary profile.

labels on very small containers is shown in Column 4 of Table VII–5.

Not every SDS and label, and not every label on very small containers, would be affected by the proposed rule. Only SDSs and labels for certain products (aerosols, desensitized explosives, and flammable gases) would be affected by the new classification criteria. Only certain very small containers would be covered by proposed paragraph (f)(12)(iii), which would eliminate some labeling requirements in certain circumstances. In particular, under proposed paragraph (f)(12)(iii), only a product identifier would be required on the immediate outer package of very small containers

(3 ml or less) where the manufacturer, importer, or distributor can demonstrate that a label would interfere with the normal use of the container and that it is not feasible to use pull-out labels, fold-back labels, or tags containing the full label information. Thus, in addition to the estimated total number of SDSs, labels, and labels on very small containers, Table VII–5 shows the number of each estimated to be affected by this proposed rule.²²

²² Note that OSHA's cost estimates for reclassifying affected chemicals and revising the corresponding SDSs and labels to achieve consistency with the reclassification (per proposed changes to Appendix B), and for revising SDSs and labels to conform with new precautionary statements and other new mandatory language in

Tables VII–6 and VII–7, respectively, provide information on total numbers of SDSs, labels, and labels on very small containers, and on the numbers of SDSs and labels (including labels on very small containers) affected by reclassification and the provisions for labels on very small containers, for all covered small entities and very small entities.

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the appendices to the HCS (per proposed changes to Appendices C and D), are based on the costs associated with chemical manufacturers editing their electronic files (which are used to produce labels and SDSs) for each product for which reclassification would be required as a result of the proposed rule. They are not based on the number of labels or SDSs actually produced or used.

Table VII-6: Labels and SDSs Affected by OSHA's Proposed Revisions to the HCS - Small Entities

NAICS Code	Industry	Total Labels [a]	Total Labels for Very Small Containers [a]	Total SDSs [a]	Labels Affected by Revision [a]	Affected Labels for Very Small Containers [a]	Affected SDSs [a]
21	Mining, Quarrying, and Oil and Gas Extraction						
211	Oil and Gas Extraction	40,513,599	11,453,477	51,139	40,513,599	0	51,139
211120	Crude Petroleum Extraction	40,513,599	11,453,477	51,139	40,513,599	0	51,139
211130	Natural Gas Extraction	1,548,460	0	41,007	1,548,460	0	41,007
31-33	Manufacturing	38,965,139	11,453,477	10,132	38,965,139	0	10,132
324	Petroleum and Coal Products Manufacturing	154,650,912	13,026,348	296,902	152,383,341	5,031,528	272,736
324110	Petroleum Refineries	951,525	0	48,486	951,525	0	48,486
324121	Asphalt Paving Mixture and Block Manufacturing	760,797	0	1,275	760,797	0	1,275
324191	Petroleum Lubricating Oil and Grease Manufacturing	132,182	0	25,675	132,182	0	25,675
324199	All Other Petroleum and Coal Products Manufacturing	25,936	0	19,491	25,936	0	19,491
325	Chemical Manufacturing	32,610	0	2,045	32,610	0	2,045
325110	Petrochemical Manufacturing	147,916,748	13,026,348	200,290	147,916,748	5,031,528	200,290
325130	Synthetic Dye and Pigment Manufacturing	0	0	388	0	0	388
325180	Other Basic Inorganic Chemical Manufacturing	1,371,499	403,141	171	1,371,499	0	171
325193	Ethyl Alcohol Manufacturing	3,389,492	996,313	364	3,389,492	398,525	364
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	32,507	0	94	32,507	0	94
325199	All Other Basic Organic Chemical Manufacturing	3,561,423	0	1,771	3,561,423	0	1,771
325211	Plastics Material and Resin Manufacturing	33,772,365	9,927,105	20,643	33,772,365	3,970,842	20,643
325311	Nitrogenous Fertilizer Manufacturing	1,136,274	0	81,505	1,136,274	0	81,505
325312	Phosphatic Fertilizer Manufacturing	0	0	8	0	0	8
325314	Fertilizer (Mixing Only) Manufacturing	151,003	44,386	12	151,003	0	12
325411	Medicinal and Botanical Manufacturing	2,521,919	0	2,054	2,521,919	0	2,054
325412	Pharmaceutical Preparation Manufacturing	1,080,369	317,565	96	1,080,369	127,026	96
325413	In-Vitro Diagnostic Substance Manufacturing	3,950,891	1,044,347	12,296	3,950,891	417,739	12,296
325414	Biological Product (except Diagnostic) Manufacturing	338,578	89,497	20,371	338,578	35,799	20,371
325510	Paint and Coating Manufacturing	771,736	203,994	2,379	771,736	81,598	2,379
325520	Adhesive Manufacturing	5,957,343	0	2,454	5,957,343	0	2,454
325612	Polish and Other Sanitation Good Manufacturing	14,032,371	0	8,900	14,032,371	0	8,900
325620	Toilet Preparation Manufacturing	336,955	0	95	336,955	0	95
325910	Printing Ink Manufacturing	46,326,620	0	17,145	46,326,620	0	17,145
325991	Custom Compounding of Purchased Resins	3,879,379	0	9,987	3,879,379	0	9,987
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	233,151	0	1,278	233,151	0	1,278
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	0	0	65	0	0	65
339	Miscellaneous Manufacturing	25,072,874	0	18,215	25,072,874	0	18,215
339112	Surgical and Medical Instrument Manufacturing	3,515,068	0	23,960	3,515,068	0	23,960
		378,353	0	122	378,353	0	122

Table VII-6: Labels and SDSs Affected by OSHA's Proposed Revisions to the HCS - Small Entities

NAICS Code	Industry	Total Labels [a]	Total Labels for Very Small Containers [a]	Total SDSs [a]	Labels Affected by Revision [a]	Affected Labels for Very Small Containers [a]	Affected SDSs [a]
339113	Surgical Appliance and Supplies Manufacturing	86,950	0	25	86,950	0	25
339114	Dental Equipment and Supplies Manufacturing	60,444	0	15	60,444	0	15
339115	Ophthalmic Goods Manufacturing	17,565	0	42	17,565	0	42
339116	Dental Laboratories	333,595	0	6,231	333,595	0	6,231
339910	Jewelry and Silverware Manufacturing	349,044	0	2,259	349,044	0	2,259
339920	Sporting and Athletic Goods Manufacturing	109,838	0	31	109,838	0	31
339930	Doll, Toy, and Game Manufacturing	115,450	0	614	115,450	0	614
339940	Office Supplies (except Paper) Manufacturing	40,925	0	11	40,925	0	11
339950	Sign Manufacturing	957,512	0	7,080	957,512	0	7,080
339991	Gasket, Packing, and Sealing Device Manufacturing	222,738	0	785	222,738	0	785
339992	Musical Instrument Manufacturing	41,387	0	14	41,387	0	14
339994	Broom, Brush, and Mop Manufacturing	103,196	0	275	103,196	0	275
339999	All Other Miscellaneous Manufacturing	698,072	0	6,457	698,072	0	6,457
Total		316,792,075	24,479,825	348,040	192,896,939	5,031,528	323,875

Sources: U.S. Census Bureau, 2020a (Document ID 0231); U.S. Census Bureau, 2020b (Document ID 0232); U.S. Census Bureau, 2019a (Document ID 0227); BLS, 2020 (Document ID 0223); U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

Note: Figures may not add to totals due to rounding.

Note: "Affected" firms, establishments, employees, labels, and SDSs are based on the maximum number affected by any one provision of the rule.

[a] Figures in these columns for two-digit and three-digit NAICS codes represent totals for the entire industry at the specified level and may exceed the total sum of the data for the affected six-digit NAICS industries that fall within the aggregated levels. This occurs because two-digit and three-digit NAICS codes may encompass some six-digit NAICS industries not covered by OSHA. (For example, NAICS 21 encompasses Mining, which is not covered by OSHA regulations.)

Table VII-7: Labels and SDSs Affected by OSHA's Proposed Revisions to the HCS – Entities with <20 Employees

NAICS Code	Industry	Total Labels [a]	Total Labels for Very Small Containers [a]	Total SDSs [a]	Labels Affected by Revision [a]	Affected Labels for Very Small Containers [a]	Affected SDSs [a]
21	Mining, Quarrying, and Oil and Gas Extraction	3,442,500	962,003	23,015	3,442,500	0	23,015
211	Oil and Gas Extraction	3,442,500	962,003	23,015	3,442,500	0	23,015
21120	Crude Petroleum Extraction	169,732	0	20,685	169,732	0	20,685
21130	Natural Gas Extraction	3,272,767	962,003	2,330	3,272,767	0	2,330
31-33	Manufacturing	25,324,696	1,671,645	92,576	24,758,981	418,638	79,103
324	Petroleum and Coal Products Manufacturing	43,576	0	30,340	43,576	0	30,340
324110	Petroleum Refineries	2,870	0	110	2,870	0	110
324121	Asphalt Paving Mixture and Block Manufacturing	25,467	0	2,380	25,467	0	2,380
324122	Asphalt Shingle and Coating Materials Manufacturing	2,067	0	670	2,067	0	670
324191	Petroleum Lubricating Oil and Grease Manufacturing	10,732	0	26,800	10,732	0	26,800
324199	All Other Petroleum and Coal Products Manufacturing	2,441	0	380	2,441	0	380
325	Chemical Manufacturing	23,424,443	1,671,645	26,037	23,424,443	418,638	26,037
325110	Petrochemical Manufacturing	81,759	24,032	70	81,759	0	70
325120	Industrial Gas Manufacturing	171,736	50,480	78	171,736	0	78
325130	Synthetic Dye and Pigment Manufacturing	231,404	68,037	404	231,404	0	404
325180	Other Basic Inorganic Chemical Manufacturing	874,414	257,027	584	874,414	102,811	584
325193	Ethyl Alcohol Manufacturing	24,475	0	95	24,475	0	95
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	225,874	0	140	225,874	0	140
325199	All Other Basic Organic Chemical Manufacturing	1,688,568	496,340	1,827	1,688,568	198,536	1,827
325211	Plastics Material and Resin Manufacturing	55,238	0	1,745	55,238	0	1,745
325212	Synthetic Rubber Manufacturing	8,822	0	128	8,822	0	128
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	18,222	0	40	18,222	0	40
325311	Nitrogenous Fertilizer Manufacturing	244,859	0	101	244,859	0	101
325312	Phosphatic Fertilizer Manufacturing	94,200	27,689	11	94,200	0	11
325314	Fertilizer (Mixing Only) Manufacturing	421,604	0	474	421,604	0	474
325320	Pesticide and Other Agricultural Chemical Manufacturing	566,329	166,468	826	566,329	0	826
325411	Medicinal and Botanical Manufacturing	695,866	204,544	1,355	695,866	81,818	1,355
325412	Pharmaceutical Preparation Manufacturing	245,447	64,879	2,920	245,447	25,952	2,920
325413	In-Vitro Diagnostic Substance Manufacturing	19,986	5,283	930	19,986	2,113	930
325414	Biological Product (except Diagnostic) Manufacturing	70,070	18,522	408	70,070	7,409	408
325510	Paint and Coating Manufacturing	4,308,873	0	3,430	4,308,873	0	3,430
325520	Adhesive Manufacturing	1,807,407	0	1,070	1,807,407	0	1,070
325611	Soap and Other Detergent Manufacturing	980,956	288,344	2,270	980,956	0	2,270
325612	Polish and Other Sanitation Good Manufacturing	1,175,050	0	582	1,175,050	0	582

Table VII-7: Labels and SDSs Affected by OSHA's Proposed Revisions to the HCS – Entities with <20 Employees

NAICS Code	Industry	Total Labels [a]	Total Labels for Very Small Containers [a]	Total SDSs [a]	Labels Affected by Revision [a]	Affected Labels for Very Small Containers [a]	Affected SDSs [a]
325613	Surface Active Agent Manufacturing	423,813	0	295	423,813	0	295
325620	Toilet Preparation Manufacturing	4,075,495	0	1,248	4,075,495	0	1,248
325910	Printing Ink Manufacturing	744,465	0	555	744,465	0	555
325920	Explosives Manufacturing	109,534	0	38	109,534	0	38
325991	Custom Compounding of Purchased Resins	26,583	0	358	26,583	0	358
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	458,814	0	435	458,814	0	435
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	3,574,522	0	3,560	3,574,522	0	3,560
339	Miscellaneous Manufacturing	1,290,882	0	22,726	1,290,882	0	22,726
339112	Surgical and Medical Instrument Manufacturing	81,805	0	651	81,805	0	651
339113	Surgical Appliance and Supplies Manufacturing	132,800	0	1,200	132,800	0	1,200
339114	Dental Equipment and Supplies Manufacturing	25,006	0	469	25,006	0	469
339115	Ophthalmic Goods Manufacturing	21,230	0	257	21,230	0	257
339116	Dental Laboratories	160,482	0	5,301	160,482	0	5,301
339910	Jewelry and Silverware Manufacturing	104,744	0	1,765	104,744	0	1,765
339920	Sporting and Athletic Goods Manufacturing	86,298	0	1,293	86,298	0	1,293
339930	Doll, Toy, and Game Manufacturing	31,802	0	434	31,802	0	434
339940	Office Supplies (except Paper) Manufacturing	23,048	0	333	23,048	0	333
339950	Sign Manufacturing	258,676	0	4,784	258,676	0	4,784
339991	Gasket, Packing, and Sealing Device Manufacturing	39,081	0	294	39,081	0	294
339992	Musical Instrument Manufacturing	22,736	0	504	22,736	0	504
339993	Fastener, Button, Needle, and Pin Manufacturing	4,662	0	76	4,662	0	76
339994	Broom, Brush, and Mop Manufacturing	10,893	0	96	10,893	0	96
339995	Burial Casket Manufacturing	3,087	0	60	3,087	0	60
339999	All Other Miscellaneous Manufacturing	284,532	0	5,209	284,532	0	5,209
Total		77,954,957	2,633,648	115,591	28,201,401	418,638	102,118

Sources: U.S. Census Bureau, 2020a (Document ID 0231); U.S. Census Bureau, 2020b (Document ID 0232); U.S. Census Bureau, 2019a (Document ID 0227); BLS, 2020 (Document ID 0223); U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

Note: Figures may not add to totals due to rounding.

Note: "Affected" firms, establishments, employees, labels, and SDSs are based on the maximum number affected by any one provision of the rule.

[a] Figures in these columns for two-digit and three-digit NAICS codes represent totals for the entire industry at the specified level and may exceed the total sum of the data for the affected six-digit NAICS industries that fall within the aggregated levels. This occurs because two-digit and three-digit NAICS codes may encompass some six-digit NAICS industries not covered by OSHA. (For example, NAICS 21 encompasses Mining, which is not covered by OSHA regulations.)

Table VI-8 shows average estimated profit rates for affected NAICS

industries based on IRS (2016) *SOI Tax Stats—Corporation Source Book* profit

data for each of the 14 years 2000–

2013.²³ Table VII–9 presents estimates of total revenues and total profits by NAICS industry code for all entities, small entities, and very small entities affected by this proposed rule. OSHA calculated total profits per NAICS industry by multiplying the average profit rate (NAICS industry) (IRS, 2016, Document ID 0004) by total revenues (NAICS industry) (U.S. Census Bureau, 2020a, Document ID 0231; U.S. Census Bureau, 2020b, Document ID 0232).

Table VII–10 shows, by NAICS industry code, OSHA’s best estimates of the percentage of establishments or entities estimated to be affected for each element of the proposed revisions to the HCS that is projected to result in costs (see Section VII.F. Compliance Costs and Cost Savings in this PEA for an explanation of the cost categories presented in this table).²⁴

²⁴ Note that the provisions that are projected to result in cost savings are not included in Table VII–10 because, for those provisions, OSHA estimates

Finally, Table VII–11 summarizes key estimates for the combined covered industries, labels, and SDSs affected by this proposed rule. The data in this table are drawn from profile tables presented earlier in this PEA and summarize both the magnitude of the global profile metrics (within the scope of Federal OSHA jurisdiction) and the magnitude of affected inputs critical to the agency’s analysis of preliminary economic impacts.

a percentage of product, rather than a percentage of entities or establishments, that would be affected.

²³ IRS, 2016, Document ID 0004.

Table VII-8: Estimated Profit Rates for Industries Affected by the Proposed Revisions to the HCS – (Net Income (less Deficit) from IRS Table 1 [Returns with and without Net Income] / Total Receipts from IRS Table 1 [Returns with and without Net Income])

NAICS Code	Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
21	Mining, Quarrying, and Oil and Gas Extraction															
211	Oil and Gas Extraction															
211120	Crude Petroleum Extraction	6.53%	5.55%	0.85%	5.50%	8.04%	14.89%	16.06%	11.11%	10.31%	-0.70%	4.68%	3.15%	-1.09%	2.36%	6.23%
211130	Natural Gas Extraction	6.53%	5.55%	0.85%	5.50%	8.04%	14.89%	16.06%	11.11%	10.31%	-0.70%	4.68%	3.15%	-1.09%	2.36%	6.23%
31-33	Manufacturing															
324	Petroleum and Coal Products Manufacturing															
324110	Petroleum Refineries	8.77%	7.99%	3.83%	6.49%	7.96%	8.57%	7.99%	7.35%	6.22%	6.59%	6.94%	5.20%	6.07%	5.39%	6.81%
324121	Asphalt Paving Mixture and Block Manufacturing	8.77%	7.99%	3.83%	6.49%	7.96%	8.57%	7.99%	7.35%	6.22%	7.63%	7.81%	5.47%	4.08%	6.40%	6.90%
324122	Asphalt Shingle and Coating Materials Manufacturing	8.77%	7.99%	3.83%	6.49%	7.96%	8.57%	7.99%	7.35%	6.22%	7.63%	7.81%	5.47%	4.08%	6.40%	6.90%
324191	Petroleum Lubricating Oil and Grease Manufacturing	8.77%	7.99%	3.83%	6.49%	7.96%	8.57%	7.99%	7.35%	6.22%	6.59%	6.95%	5.20%	6.05%	5.39%	6.81%
324199	All Other Petroleum and Coal Products Manufacturing	8.77%	7.99%	3.83%	6.49%	7.96%	8.57%	7.99%	7.35%	6.22%	6.59%	6.95%	5.20%	6.05%	5.39%	6.81%
325	Chemical Manufacturing															
325110	Petrochemical Manufacturing	1.93%	-1.88%	-0.92%	3.08%	1.16%	6.94%	5.82%	4.63%	2.18%	2.25%	5.76%	4.31%	5.71%	6.82%	3.41%
325120	Industrial Gas Manufacturing	1.93%	-1.88%	-0.92%	3.08%	1.16%	6.94%	5.82%	4.63%	2.18%	2.25%	5.76%	4.31%	5.71%	6.82%	3.41%
325130	Synthetic Dye and Pigment Manufacturing	1.93%	-1.88%	-0.92%	3.08%	1.16%	6.94%	5.82%	4.63%	2.18%	2.25%	5.76%	4.31%	5.71%	6.82%	3.41%
325180	Other Basic Inorganic Chemical Manufacturing	1.93%	-1.88%	-0.92%	3.08%	1.16%	6.94%	5.82%	4.63%	2.18%	2.25%	5.76%	4.31%	5.71%	6.82%	3.41%
325193	Ethyl Alcohol Manufacturing	1.93%	-1.88%	-0.92%	3.08%	1.16%	6.94%	5.82%	4.63%	2.18%	2.25%	5.76%	4.31%	5.71%	6.82%	3.41%
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	1.93%	-1.88%	-0.92%	3.08%	1.16%	6.94%	5.82%	4.63%	2.18%	2.25%	5.76%	4.31%	5.71%	6.82%	3.41%
325199	All Other Basic Organic Chemical Manufacturing	1.93%	-1.88%	-0.92%	3.08%	1.16%	6.94%	5.82%	4.63%	2.18%	2.25%	5.76%	4.31%	5.71%	6.82%	3.41%
325211	Plastics Material and Resin Manufacturing	4.50%	10.28%	0.92%	1.98%	3.16%	23.55%	7.83%	7.23%	2.08%	-0.22%	4.91%	3.43%	4.83%	8.68%	5.94%
325212	Synthetic Rubber Manufacturing	4.50%	10.28%	0.92%	1.98%	3.16%	23.55%	7.83%	7.23%	2.08%	-0.22%	4.91%	3.43%	4.83%	8.68%	5.94%
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	4.50%	10.28%	0.92%	1.98%	3.16%	23.55%	7.83%	7.23%	2.08%	-0.22%	4.91%	3.43%	4.83%	8.68%	5.94%
325311	Nitrogenous Fertilizer Manufacturing	7.17%	6.83%	7.20%	8.32%	7.44%	20.64%	9.91%	9.08%	8.59%	13.43%	9.93%	8.63%	9.32%	9.51%	9.71%
325312	Phosphatic Fertilizer Manufacturing	7.17%	6.83%	7.20%	8.32%	7.44%	20.64%	9.91%	9.08%	8.59%	13.43%	9.93%	8.63%	9.32%	9.51%	9.71%
325314	Fertilizer (Mixing Only) Manufacturing	7.17%	6.83%	7.20%	8.32%	7.44%	20.64%	9.91%	9.08%	8.59%	13.43%	9.93%	8.63%	9.32%	9.51%	9.71%
325320	Pesticide and Other Agricultural Chemical Manufacturing	7.17%	6.83%	7.20%	8.32%	7.44%	20.64%	9.91%	9.08%	8.59%	13.43%	9.93%	8.63%	9.32%	9.51%	9.71%
325411	Medicinal and Botanical Manufacturing	11.96%	11.48%	11.32%	12.05%	11.84%	32.22%	14.50%	13.01%	12.42%	19.61%	12.08%	10.93%	10.88%	9.89%	13.87%
325412	Pharmaceutical Preparation Manufacturing	11.96%	11.48%	11.32%	12.05%	11.84%	32.22%	14.50%	13.01%	12.42%	19.61%	12.08%	10.93%	10.88%	9.89%	13.87%
325413	In-Vitro Diagnostic Substance Manufacturing	11.96%	11.48%	11.32%	12.05%	11.84%	32.22%	14.50%	13.01%	12.42%	19.61%	12.08%	10.93%	10.88%	9.89%	13.87%
325414	Biological Product (except Diagnostic) Manufacturing	11.96%	11.48%	11.32%	12.05%	11.84%	32.22%	14.50%	13.01%	12.42%	19.61%	12.08%	10.93%	10.88%	9.89%	13.87%
325510	Paint and Coating Manufacturing	3.64%	3.69%	3.79%	4.48%	4.85%	5.45%	5.11%	5.15%	2.66%	3.28%	4.01%	3.90%	3.92%	4.48%	4.17%
325520	Adhesive Manufacturing	3.64%	3.69%	3.79%	4.48%	4.85%	5.45%	5.11%	5.15%	2.66%	3.28%	4.01%	3.90%	3.92%	4.48%	4.17%
325611	Soap and Other Detergent Manufacturing	6.88%	7.60%	9.62%	9.68%	7.89%	10.60%	10.11%	8.42%	14.61%	19.77%	19.03%	16.21%	15.78%	16.61%	12.34%
325612	Polish and Other Sanitation Good Manufacturing	6.88%	7.60%	9.62%	9.68%	7.89%	10.60%	10.11%	8.42%	14.61%	19.77%	19.03%	16.21%	15.78%	16.61%	12.34%
325613	Surface Active Agent Manufacturing	6.88%	7.60%	9.62%	9.68%	7.89%	10.60%	10.11%	8.42%	14.61%	19.77%	19.03%	16.21%	15.78%	16.61%	12.34%

Table VII-8: Estimated Profit Rates for Industries Affected by the Proposed Revisions to the HCS – (Net Income (less Deficit) from IRS Table 1 (Returns with and without Net Income) / Total Receipts from IRS Table 1 (Returns with and without Net Income))

NACIS Code	Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
325620	Toilet Preparation Manufacturing	6.88%	7.60%	9.62%	9.68%	7.89%	10.60%	10.11%	8.42%	14.61%	19.77%	19.03%	16.21%	15.78%	16.61%	12.34%
325910	Printing Ink Manufacturing	3.19%	2.02%	3.57%	0.86%	1.42%	5.03%	2.20%	6.33%	6.06%	5.89%	5.83%	8.92%	9.86%	9.81%	5.07%
325920	Explosives Manufacturing	3.19%	2.02%	3.57%	0.86%	1.42%	5.03%	2.20%	6.33%	6.06%	5.89%	5.83%	8.92%	9.86%	9.81%	5.07%
325991	Custom Compounding of Purchased Resins	3.19%	2.02%	3.57%	0.86%	1.42%	5.03%	2.20%	6.33%	6.06%	5.89%	5.83%	8.92%	9.86%	9.81%	5.07%
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	3.19%	2.02%	3.57%	0.86%	1.42%	5.03%	2.20%	6.33%	6.06%	5.89%	5.83%	8.92%	9.86%	9.81%	5.07%
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	3.19%	2.02%	3.57%	0.86%	1.42%	5.03%	2.20%	6.33%	6.06%	5.89%	5.83%	8.92%	9.86%	9.81%	5.07%
326	Plastics and Rubber Products Manufacturing															
326111	Plastics Bag and Pouch Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326121	Unlaminated Plastics Profile Shape Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326122	Plastics Pipe and Pipe Fitting Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326140	Polystyrene Foam Product Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326160	Plastics Bottle Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326191	Plastics Plumbing Fixture Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326199	All Other Plastics Product Manufacturing	2.49%	1.24%	1.57%	1.50%	2.51%	3.62%	2.17%	2.74%	1.24%	2.32%	2.84%	3.00%	4.68%	4.01%	2.57%
326211	Tire Manufacturing (except Retreading)	1.61%	-0.88%	0.03%	0.58%	1.48%	1.82%	1.45%	4.41%	-2.00%	1.21%	1.94%	3.39%	4.68%	4.01%	1.69%
326212	Tire Retreading	1.61%	-0.88%	0.03%	0.58%	1.48%	1.82%	1.45%	4.41%	-2.00%	1.21%	1.94%	3.39%	4.68%	4.01%	1.69%
326220	Rubber and Plastics Hoses and Belting Manufacturing	1.61%	-0.88%	0.03%	0.58%	1.48%	1.82%	1.45%	4.41%	-2.00%	1.21%	1.94%	3.39%	4.68%	4.01%	1.69%
326291	Rubber Product Manufacturing for Mechanical Use	1.61%	-0.88%	0.03%	0.58%	1.48%	1.82%	1.45%	4.41%	-2.00%	1.21%	1.94%	3.39%	4.68%	4.01%	1.69%
326299	All Other Rubber Product Manufacturing	1.61%	-0.88%	0.03%	0.58%	1.48%	1.82%	1.45%	4.41%	-2.00%	1.21%	1.94%	3.39%	4.68%	4.01%	1.69%
327	Nonmetallic Mineral Product Manufacturing															
327110	Pottery, Ceramics, and Plumbing Fixture Manufacturing	1.83%	0.88%	-0.38%	-0.03%	3.40%	6.29%	-2.15%	-5.12%	2.81%	1.77%	1.09%	3.50%	3.50%	4.62%	1.57%
327120	Clay Building Material and Refractories Manufacturing	1.83%	0.88%	-0.38%	-0.03%	3.40%	6.29%	-2.15%	-5.12%	2.81%	1.77%	1.09%	3.50%	3.50%	4.62%	1.57%
327211	Flat Glass Manufacturing	1.62%	2.63%	0.89%	0.20%	-0.34%	0.22%	2.12%	8.88%	0.22%	1.81%	7.03%	4.75%	4.09%	5.51%	2.83%
327212	Other Pressed and Blown Glass and Glassware Manufacturing	1.62%	2.63%	0.89%	0.20%	-0.34%	0.22%	2.12%	8.88%	0.22%	1.81%	7.03%	4.75%	4.09%	5.51%	2.83%
327213	Glass Container Manufacturing	1.62%	2.63%	0.89%	0.20%	-0.34%	0.22%	2.12%	8.88%	0.22%	1.81%	7.03%	4.75%	4.09%	5.51%	2.83%
327215	Glass Product Manufacturing Made of Purchased Glass	1.62%	2.63%	0.89%	0.20%	-0.34%	0.22%	2.12%	8.88%	0.22%	1.81%	7.03%	4.75%	4.09%	5.51%	2.83%
327310	Cement Manufacturing	6.22%	3.38%	2.77%	3.05%	5.23%	10.26%	4.23%	4.70%	-2.69%	-7.44%	-5.71%	-4.26%	-1.15%	1.99%	1.47%
327320	Ready-Mix Concrete Manufacturing	6.22%	3.38%	2.77%	3.05%	5.23%	10.26%	4.23%	4.70%	-2.69%	-7.44%	-5.71%	-4.26%	-1.15%	1.99%	1.47%
327331	Concrete Block and Brick Manufacturing	6.22%	3.38%	2.77%	3.05%	5.23%	10.26%	4.23%	4.70%	-2.69%	-7.44%	-5.71%	-4.26%	-1.15%	1.99%	1.47%

Table VII-8: Estimated Profit Rates for Industries Affected by the Proposed Revisions to the HCS — (Net Income (less Deficit) from IRS Table 1 [Returns with and without Net Income] / Total Receipts from IRS Table 1 [Returns with and without Net Income])

NAICS Code	Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
327332	Concrete Pipe Manufacturing	6.22%	3.38%	2.77%	3.05%	5.23%	10.26%	4.23%	4.70%	-2.69%	-7.44%	-5.71%	-4.56%	-1.15%	1.99%	1.47%
327390	Other Concrete Product Manufacturing	6.22%	3.38%	2.77%	3.05%	5.23%	10.26%	4.23%	4.70%	-2.69%	-7.44%	-5.71%	-4.56%	-1.15%	1.99%	1.47%
327410	Lime Manufacturing	3.98%	2.68%	1.71%	1.82%	3.65%	7.55%	2.64%	3.88%	-1.15%	-3.69%	-1.09%	-0.31%	1.12%	3.41%	1.87%
327420	Gypsum Product Manufacturing	3.98%	2.68%	1.71%	1.82%	3.65%	7.55%	2.64%	3.88%	-1.15%	-3.69%	-1.09%	-0.31%	1.12%	3.41%	1.87%
327910	Abrasive Product Manufacturing	3.98%	2.68%	1.71%	1.82%	3.65%	7.55%	2.64%	3.88%	-1.15%	-3.69%	-1.09%	-0.31%	1.12%	3.41%	1.87%
327991	Cut Stone and Stone Product Manufacturing	3.98%	2.68%	1.71%	1.82%	3.65%	7.55%	2.64%	3.88%	-1.15%	-3.69%	-1.09%	-0.31%	1.12%	3.41%	1.87%
327992	Ground or Treated Mineral and Earth Manufacturing	3.98%	2.68%	1.71%	1.82%	3.65%	7.55%	2.64%	3.88%	-1.15%	-3.69%	-1.09%	-0.31%	1.12%	3.41%	1.87%
327993	Mineral Wool Manufacturing	3.98%	2.68%	1.71%	1.82%	3.65%	7.55%	2.64%	3.88%	-1.15%	-3.69%	-1.09%	-0.31%	1.12%	3.41%	1.87%
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	3.98%	2.68%	1.71%	1.82%	3.65%	7.55%	2.64%	3.88%	-1.15%	-3.69%	-1.09%	-0.31%	1.12%	3.41%	1.87%
331	Primary Metal Manufacturing															
331110	Iron and Steel Mills and Ferroalloy Manufacturing	-1.23%	-6.39%	-2.58%	-3.92%	7.34%	7.74%	8.96%	6.43%	5.80%	-6.26%	-0.65%	0.55%	1.79%	-0.23%	1.24%
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	0.56%	-2.50%	-1.32%	-1.77%	5.58%	6.44%	7.55%	7.04%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.08%
331221	Rolled Steel Shape Manufacturing	0.56%	-2.50%	-1.32%	-1.77%	5.58%	6.44%	7.55%	7.04%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.08%
331222	Steel Wire Drawing	0.56%	-2.50%	-1.32%	-1.77%	5.58%	6.44%	7.55%	7.04%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.08%
331313	Alumina Refining and Primary Aluminum Production	2.50%	0.74%	-0.16%	1.39%	3.72%	4.88%	6.17%	7.76%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.47%
331314	Secondary Smelting and Alloying of Aluminum	2.50%	0.74%	-0.16%	1.39%	3.72%	4.88%	6.17%	7.76%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.47%
331315	Aluminum Sheet, Plate, and Foil Manufacturing	2.50%	0.74%	-0.16%	1.39%	3.72%	4.88%	6.17%	7.76%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.47%
331318	Other Aluminum Rolling, Drawing, and Extruding	2.50%	0.74%	-0.16%	1.39%	3.72%	4.88%	6.17%	7.76%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.47%
331410	Nonferrous Metal (except Aluminum) Smelting and Refining	0.56%	-2.50%	-1.32%	-1.77%	5.58%	6.44%	7.55%	7.04%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.08%
331420	Copper Rolling, Drawing, Extruding, and Alloying	0.56%	-2.50%	-1.32%	-1.77%	5.58%	6.44%	7.55%	7.04%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.08%
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	0.56%	-2.50%	-1.32%	-1.77%	5.58%	6.44%	7.55%	7.04%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.08%
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	0.56%	-2.50%	-1.32%	-1.77%	5.58%	6.44%	7.55%	7.04%	4.38%	-3.37%	1.14%	1.77%	2.36%	1.29%	2.08%
331511	Iron Foundries	1.03%	1.46%	0.31%	-0.44%	1.65%	4.95%	5.78%	7.11%	6.39%	3.99%	7.09%	7.57%	9.76%	9.48%	4.72%
331512	Steel Investment Foundries	1.03%	1.46%	0.31%	-0.44%	1.65%	4.95%	5.78%	7.11%	6.39%	3.99%	7.09%	7.57%	9.76%	9.48%	4.72%
331513	Steel Foundries (except Investment)	1.03%	1.46%	0.31%	-0.44%	1.65%	4.95%	5.78%	7.11%	6.39%	3.99%	7.09%	7.57%	9.76%	9.48%	4.72%
331523	Nonferrous Metal Die-Casting Foundries	1.03%	1.46%	0.31%	-0.44%	1.65%	4.95%	5.78%	7.11%	6.39%	3.99%	7.09%	7.57%	9.76%	9.48%	4.72%
331524	Aluminum Foundries (except Die-Casting)	1.03%	1.46%	0.31%	-0.44%	1.65%	4.95%	5.78%	7.11%	6.39%	3.99%	7.09%	7.57%	9.76%	9.48%	4.72%
331529	Other Nonferrous Metal Foundries (except Die-Casting)	1.03%	1.46%	0.31%	-0.44%	1.65%	4.95%	5.78%	7.11%	6.39%	3.99%	7.09%	7.57%	9.76%	9.48%	4.72%
339	Miscellaneous Manufacturing															
339112	Surgical and Medical Instrument Manufacturing	5.23%	4.45%	5.07%	3.98%	6.14%	15.65%	11.07%	7.53%	5.63%	7.65%	7.65%	7.72%	7.40%	7.18%	7.33%
339113	Surgical Appliance and Supplies Manufacturing	5.23%	4.45%	5.07%	3.98%	6.14%	15.65%	11.07%	7.53%	5.63%	7.65%	7.65%	7.72%	7.40%	7.18%	7.33%
339114	Dental Equipment and Supplies Manufacturing	5.23%	4.45%	5.07%	3.98%	6.14%	15.65%	11.07%	7.53%	5.63%	7.65%	7.65%	7.72%	7.40%	7.18%	7.33%
339115	Ophthalmic Goods Manufacturing	5.23%	4.45%	5.07%	3.98%	6.14%	15.65%	11.07%	7.53%	5.63%	7.65%	7.65%	7.72%	7.40%	7.18%	7.33%
339116	Dental Laboratories	5.23%	4.45%	5.07%	3.98%	6.14%	15.65%	11.07%	7.53%	5.63%	7.65%	7.65%	7.72%	7.40%	7.18%	7.33%

Table VII-8: Estimated Profit Rates for Industries Affected by the Proposed Revisions to the HCS – (Net Income (less Deficit) from IRS Table 1 [Returns with and without Net Income] / Total Receipts from IRS Table 1 [Returns with and without Net Income])

NAICS Code	Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
339910	Jewelry and Silverware Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339920	Sporting and Athletic Goods Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339930	Doll, Toy, and Game Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339940	Office Supplies (except Paper) Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339950	Sign Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339991	Gasket, Packing, and Sealing Device Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339992	Musical Instrument Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339993	Fastener, Button, Needle, and Pin Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339994	Broom, Brush, and Mop Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339995	Burial Casket Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
339999	All Other Miscellaneous Manufacturing	3.26%	1.81%	2.91%	3.05%	3.19%	5.11%	5.41%	4.26%	3.63%	2.80%	4.68%	4.51%	6.37%	5.47%	4.03%
42	Wholesale Trade															
423	Merchant Wholesalers, Durable Goods															
42450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	0.83%	0.32%	1.19%	1.01%	2.37%	2.56%	2.81%	2.51%	1.96%	2.27%	3.70%	3.73%	4.65%	4.86%	2.48%
423840	Industrial Supplies Merchant Wholesalers	2.05%	1.61%	0.82%	1.57%	2.92%	4.31%	4.28%	3.93%	3.42%	2.23%	3.47%	3.70%	4.49%	4.40%	3.09%
424	Merchant Wholesalers, Nondurable Goods															
424210	Drugs and Druggists' Sundries Merchant Wholesalers	1.82%	2.54%	3.73%	3.93%	3.20%	3.22%	3.47%	3.64%	2.98%	3.55%	4.02%	3.68%	4.33%	4.48%	3.47%
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers	2.58%	1.52%	2.11%	2.52%	2.21%	3.62%	3.28%	3.81%	3.37%	3.58%	3.30%	3.68%	3.73%	3.46%	3.05%
424690	Other Chemical and Allied Products Merchant Wholesalers	2.58%	1.52%	2.11%	2.52%	2.21%	3.62%	3.28%	3.81%	3.37%	3.58%	3.30%	3.68%	3.73%	3.46%	3.05%
424710	Petroleum Bulk Stations and Terminals	0.98%	0.42%	0.28%	1.18%	1.86%	2.54%	2.07%	2.01%	1.10%	0.82%	0.11%	-0.44%	0.46%	0.10%	0.96%
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	0.98%	0.42%	0.28%	1.18%	1.86%	2.54%	2.07%	2.01%	1.10%	0.82%	0.11%	-0.44%	0.46%	0.10%	0.96%
424910	Farm Supplies Merchant Wholesalers	1.52%	1.36%	1.68%	2.63%	2.74%	2.98%	2.31%	1.99%	2.12%	2.37%	4.76%	4.21%	4.19%	3.09%	2.71%
424950	Paint, Varnish, and Supplies Merchant Wholesalers	1.52%	1.36%	1.68%	2.63%	2.74%	2.98%	2.31%	1.99%	2.12%	2.47%	2.78%	2.23%	2.94%	2.76%	2.32%
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	1.52%	1.36%	1.68%	2.63%	2.74%	2.98%	2.31%	1.99%	2.12%	2.47%	2.78%	2.23%	2.94%	2.76%	2.32%

Note: IRS profit data are available at varying NAICS levels; Where an estimate is not available we use the next-least granular NAICS with data available.

Source: U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health based on IRS, 2016 (Document ID 0001).

Table VII-9: Estimated Total Revenues and Profits for Industries Affected by the Proposed Revisions to the HCS, by Establishment Size

NAICS Code	Industry	All Entities			Small Entities			Very Small Entities (Fewer than 20 Employees)		
		Revenues	Profits		Revenues	Profits		Revenues	Profits	
21	Mining, Quarrying, and Oil and Gas Extraction	\$326,848,327,601	\$21,110,919,773		\$126,641,777,686	\$8,118,387,317		\$17,191,968,980	\$1,130,270,113	
211	Oil and Gas Extraction	\$240,298,917,934	\$14,974,398,582		\$100,248,982,771	\$6,247,086,913		\$10,327,453,313	\$643,562,624	
21120	Crude Petroleum Extraction	\$170,279,184,328	\$10,611,068,906		\$74,442,621,084	\$4,638,945,066		\$8,159,920,407	\$508,491,264	
21130	Natural Gas Extraction	\$70,019,733,607	\$4,363,329,676		\$25,806,361,687	\$1,608,141,848		\$2,167,532,907	\$135,071,360	
31-33	Manufacturing	\$5,797,450,564,984	\$264,415,656,740		\$1,019,372,711,131	\$46,934,620,433		\$201,349,874,448	\$8,599,149,973	
324	Petroleum and Coal Products Manufacturing	\$548,268,340,205	\$37,365,772,412		\$36,291,381,929	\$2,477,359,321		\$2,264,038,256	\$155,524,865	
324110	Petroleum Refineries	\$502,164,011,213	\$34,203,490,777		\$27,122,075,639	\$1,847,343,982		\$102,309,469	\$6,968,522	
324121	Asphalt Paving Mixture and Block Manufacturing	\$13,860,504,187	\$955,963,177		\$6,354,692,152	\$438,285,045		\$1,224,335,797	\$84,442,811	
324122	Asphalt Shingle and Coating Materials Mfg.	\$11,617,097,706	\$801,234,752		\$0	\$0		\$304,121,711	\$20,975,367	
324191	Petroleum Lubricating Oil and Grease Mfg.	\$16,586,696,926	\$1,129,878,602		\$1,246,859,746	\$84,935,545		\$515,936,132	\$35,145,346	
324199	All Other Petroleum and Coal Products Mfg.	\$4,040,030,172	\$275,205,103		\$1,567,754,391	\$106,794,749		\$117,335,147	\$7,992,819	
325	Chemical Manufacturing	\$789,429,171,514	\$65,825,402,786		\$133,195,382,934	\$11,287,569,408		\$15,398,580,338	\$1,259,377,873	
325110	Petrochemical Manufacturing	\$55,741,502,666	\$1,902,021,496		\$0	\$0		\$54,148,510	\$1,847,665	
325120	Industrial Gas Manufacturing	\$9,700,639,626	\$331,006,956		\$0	\$0		\$113,739,490	\$3,881,039	
325130	Synthetic Dye and Pigment Manufacturing	\$7,293,474,420	\$248,869,235		\$908,334,950	\$30,994,367		\$153,296,928	\$5,230,825	
325180	Other Basic Inorganic Chemical Manufacturing	\$33,275,419,838	\$1,135,429,811		\$2,244,838,764	\$76,598,789		\$579,118,600	\$19,760,788	
325193	Ethyl Alcohol Manufacturing	\$32,337,672,494	\$1,103,431,829		\$315,684,675	\$10,771,849		\$237,677,096	\$8,110,060	
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	\$8,105,063,187	\$276,562,412		\$1,276,990,010	\$43,573,681		\$80,989,829	\$2,763,549	
325199	All Other Basic Organic Chemical Manufacturing	\$80,041,612,356	\$2,731,194,173		\$22,367,221,007	\$763,218,305		\$1,118,327,492	\$38,159,770	
325211	Plastics Material and Resin Manufacturing	\$94,876,413,479	\$5,636,119,712		\$23,872,209,387	\$1,418,125,169		\$1,160,497,774	\$68,939,204	
325212	Synthetic Rubber Manufacturing	\$8,750,057,350	\$519,795,900		\$0	\$0		\$185,348,301	\$11,010,589	
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	\$7,325,632,100	\$435,178,122		\$0	\$0		\$109,443,461	\$6,501,473	
325311	Nitrogenous Fertilizer Manufacturing	\$6,178,183,955	\$600,201,186		\$0	\$0		\$339,914,652	\$33,022,192	
325312	Phosphatic Fertilizer Manufacturing	\$5,725,430,291	\$356,216,855		\$100,008,328	\$9,715,657		\$62,388,297	\$6,060,928	
325314	Fertilizer (Mixing Only) Manufacturing	\$4,931,889,637	\$479,125,586		\$3,500,940,093	\$340,111,012		\$585,272,906	\$56,858,374	
325320	Pesticide and Other Agricultural Chemical Mfg.	\$15,622,076,997	\$1,517,661,048		\$0	\$0		\$375,076,009	\$36,438,064	
325411	Medicinal and Botanical Manufacturing	\$11,504,963,235	\$1,595,818,501		\$715,521,577	\$99,247,824		\$460,867,342	\$63,925,509	
325412	Pharmaceutical Preparation Manufacturing	\$186,027,072,841	\$25,803,250,170		\$30,020,579,790	\$4,164,063,428		\$1,865,009,961	\$238,689,866	
325413	In-Vitro Diagnostic Substance Manufacturing	\$14,420,723,180	\$2,000,254,706		\$2,572,663,655	\$356,846,361		\$151,862,834	\$21,064,432	
325414	Biological Product (except Diagnostic) Manufacturing	\$31,996,374,817	\$4,438,119,954		\$5,863,984,063	\$813,375,416		\$532,418,832	\$73,850,199	
325510	Paint and Coating Manufacturing	\$28,755,602,915	\$1,199,560,340		\$2,152,126,723	\$89,777,490		\$1,556,606,813	\$64,934,956	
325520	Adhesive Manufacturing	\$15,404,571,015	\$642,612,589		\$5,069,280,212	\$211,468,614		\$652,936,917	\$27,237,726	
325611	Soap and Other Detergent Manufacturing	\$25,419,002,064	\$3,137,684,958		\$0	\$0		\$649,681,023	\$80,195,689	
325612	Polish and Other Sanitation Good Manufacturing	\$6,433,601,711	\$794,154,517		\$121,727,113	\$15,025,819		\$424,493,885	\$52,398,913	

Table VII-9: Estimated Total Revenues and Profits for Industries Affected by the Proposed Revisions to the HCS, by Establishment Size

NAICS Code	Industry	All Entities		Small Entities		Very Small Entities (Fewer than 20 Employees)	
		Revenues	Profits	Revenues	Profits	Revenues	Profits
325613	Surface Active Agent Manufacturing	\$7,488,008,843	\$924,309,013	\$0	\$0	\$153,105,159	\$18,899,080
325620	Toilet Preparation Manufacturing	\$43,279,075,380	\$5,342,306,652	\$16,735,776,539	\$2,065,840,121	\$1,472,297,515	\$181,738,282
325910	Printing Ink Manufacturing	\$4,534,098,456	\$229,935,022	\$1,401,449,523	\$71,070,871	\$268,942,637	\$13,638,727
325920	Explosives Manufacturing	\$2,483,129,453	\$125,925,458	\$0	\$0	\$39,569,945	\$2,006,687
325991	Custom Compounding of Purchased Resins	\$11,882,633,328	\$602,506,873	\$4,898,316,623	\$248,405,400	\$558,480,571	\$28,321,891
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	\$7,036,771,608	\$356,851,588	\$0	\$0	\$165,749,365	\$8,405,548
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	\$22,858,474,270	\$1,159,208,126	\$9,057,729,902	\$459,339,236	\$1,291,318,197	\$65,485,847
326	Plastics and Rubber Products Manufacturing	\$247,748,726,309	\$5,974,209,486	\$29,139,202,553	\$684,076,077	\$8,440,100,253	\$206,019,667
326111	Plastics Bag and Pouch Manufacturing	\$11,673,118,042	\$299,485,288	\$784,503,219	\$20,127,199	\$289,529,597	\$7,428,166
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	\$13,981,710,136	\$358,714,481	\$1,208,634,905	\$31,008,713	\$253,189,490	\$6,495,825
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	\$16,764,409,928	\$430,107,373	\$1,576,497,917	\$40,446,600	\$389,897,411	\$10,003,200
326121	Unlaminated Plastics Profile Shape Manufacturing	\$8,405,469,386	\$215,650,558	\$2,702,661,509	\$69,339,431	\$212,873,316	\$5,461,474
326122	Plastics Pipe and Pipe Fitting Manufacturing	\$11,149,151,610	\$286,042,415	\$225,529,681	\$5,786,185	\$319,401,690	\$8,194,563
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	\$4,558,892,856	\$116,902,866	\$1,742,170,853	\$44,697,101	\$175,678,590	\$4,507,206
326140	Polystyrene Foam Product Manufacturing	\$10,048,849,303	\$257,813,081	\$1,052,864,685	\$27,012,276	\$369,023,841	\$9,467,668
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	\$11,390,162,766	\$292,225,793	\$857,095,712	\$21,989,631	\$463,923,130	\$11,902,403
326160	Plastics Bottle Manufacturing	\$11,711,421,690	\$300,468,006	\$3,432,455,453	\$88,063,010	\$153,118,708	\$3,928,411
326191	Plastics Plumbing Fixture Manufacturing	\$4,393,033,016	\$112,707,569	\$550,566,149	\$14,125,314	\$246,216,000	\$6,316,913
326199	All Other Plastics Product Manufacturing	\$99,843,663,537	\$2,561,587,076	\$7,718,903,091	\$198,036,027	\$4,360,390,703	\$111,870,098
326211	Tire Manufacturing (except Retreading)	\$18,217,353,429	\$308,505,467	\$1,062,901,057	\$18,005,165	\$42,665,336	\$722,736
326212	Tire Retreading	\$1,750,825,443	\$29,658,358	\$878,258,502	\$14,877,386	\$226,970,376	\$3,844,797
326220	Rubber and Plastics Hoses and Belting Manufacturing	\$5,525,287,685	\$93,596,402	\$469,067,062	\$7,945,829	\$195,530,785	\$3,312,222
326291	Rubber Product Manufacturing for Mechanical Use	\$7,932,574,831	\$134,374,987	\$666,269,920	\$11,286,375	\$280,991,735	\$4,759,900
326299	All Other Rubber Product Manufacturing	\$10,402,802,651	\$176,219,765	\$4,210,822,837	\$71,329,836	\$460,699,545	\$7,804,086
327	Nonmetallic Mineral Product Manufacturing	\$131,885,843,897	\$2,461,308,698	\$39,957,576,507	\$648,610,549	\$9,253,585,860	\$160,254,290
327110	Pottery, Ceramics, and Plumbing Fixture Mfg.	\$2,319,233,154	\$36,481,726	\$277,050,335	\$4,358,024	\$240,529,651	\$3,783,551
327120	Clay Building Material and Refractories Mfg.	\$5,881,207,701	\$92,511,875	\$706,797,682	\$11,117,985	\$392,927,143	\$6,180,776
327211	Flat Glass Mfg.	\$4,388,366,999	\$124,247,799	\$0	\$0	\$34,821,593	\$985,993
327212	Other Pressed and Blown Glass and Glassware Manufacturing	\$3,522,384,800	\$99,729,252	\$1,168,942,607	\$33,096,262	\$200,184,295	\$5,667,816
327213	Glass Container Manufacturing	\$5,272,106,533	\$149,269,109	\$333,956,284	\$9,455,302	\$18,906,902	\$535,311

Table VII-9: Estimated Total Revenues and Profits for Industries Affected by the Proposed Revisions to the HCS, by Establishment Size

NAICS Code	Industry	All Entities		Small Entities		Very Small Entities (Fewer than 20 Employees)	
		Revenues	Profits	Revenues	Profits	Revenues	Profits
327215	Glass Product Manufacturing Made of Purchased Glass	\$13,900,601,495	\$393,567,616	\$686,676,277	\$19,441,860	\$694,354,717	\$19,659,259
327310	Cement Manufacturing	\$9,050,480,224	\$133,073,152	\$527,929,122	\$7,762,372	\$113,207,958	\$1,664,546
327320	Ready-Mix Concrete Manufacturing	\$32,398,760,101	\$476,373,077	\$17,735,436,381	\$260,771,844	\$3,102,958,186	\$45,624,145
327331	Concrete Block and Brick Manufacturing	\$4,879,471,211	\$71,744,990	\$2,979,630,278	\$43,810,801	\$448,924,550	\$6,000,733
327332	Concrete Pipe Manufacturing	\$1,708,315,398	\$25,118,105	\$157,861,666	\$2,321,109	\$84,751,199	\$1,246,134
327390	Other Concrete Product Manufacturing	\$12,334,383,335	\$181,357,809	\$7,821,743,134	\$115,006,495	\$1,265,924,521	\$18,613,439
327410	Lime Manufacturing	\$2,355,559,712	\$44,069,981	\$0	\$0	\$38,643,412	\$722,977
327420	Gypsum Product Manufacturing	\$6,468,574,425	\$121,020,050	\$0	\$0	\$168,446,629	\$3,151,455
327910	Abrasive Product Manufacturing	\$5,886,203,059	\$110,124,510	\$0	\$0	\$307,171,245	\$5,746,843
327991	Cut Stone and Stone Product Manufacturing	\$5,236,293,789	\$97,965,408	\$4,360,344,846	\$81,577,349	\$1,479,155,319	\$27,673,400
327992	Ground or Treated Mineral and Earth Mfg.	\$4,456,620,907	\$83,378,570	\$1,326,716,138	\$24,821,428	\$158,566,389	\$2,966,606
327993	Mineral Wool Manufacturing	\$6,445,499,687	\$120,588,346	\$246,343,878	\$4,608,828	\$162,470,543	\$3,039,649
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	\$5,381,781,367	\$100,687,324	\$1,628,147,880	\$30,460,891	\$341,641,610	\$6,391,746
331	Primary Metal Manufacturing	\$232,471,614,560	\$5,007,068,940	\$30,289,721,564	\$751,879,539	\$3,863,267,143	\$106,827,885
331110	Iron and Steel Mills and Ferroalloy Manufacturing	\$93,922,044,820	\$1,165,821,393	\$12,141,766,502	\$150,711,488	\$556,014,680	\$6,901,615
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	\$11,067,013,255	\$230,377,817	\$1,426,594,136	\$29,696,869	\$74,174,756	\$1,544,068
331221	Rolled Steel Shape Manufacturing	\$5,992,331,220	\$124,740,086	\$524,401,481	\$10,916,267	\$222,220,982	\$4,625,890
331222	Steel Wire Drawing	\$5,581,251,741	\$116,182,800	\$1,092,743,284	\$22,747,222	\$173,334,657	\$3,649,875
331313	Alumina Refining and Primary Aluminum Production	\$3,537,971,191	\$87,352,773	\$0	\$0	\$9,684,303	\$239,106
331314	Secondary Smelting and Alloying of Aluminum	\$6,039,040,368	\$149,104,358	\$0	\$0	\$85,089,920	\$2,100,876
331315	Aluminum Sheet, Plate, and Foil Manufacturing	\$15,749,488,321	\$381,314,941	\$1,812,679,081	\$43,887,243	\$138,958,073	\$3,364,350
331318	Other Aluminum Rolling, Drawing, and Extruding	\$11,879,785,984	\$293,312,803	\$1,042,425,463	\$25,737,563	\$179,057,465	\$4,420,942
331410	Nonferrous Metal (except Aluminum) Smelting and Refining	\$9,746,852,678	\$202,896,535	\$1,513,416,451	\$31,504,216	\$334,535,758	\$6,963,904
331420	Copper Rolling, Drawing, Extruding, and Alloying	\$23,335,378,243	\$485,763,717	\$2,483,469,095	\$51,697,434	\$273,053,150	\$5,684,044
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	\$6,982,835,711	\$145,359,042	\$181,179,708	\$3,771,549	\$272,540,378	\$5,673,370
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	\$7,574,445,310	\$157,674,355	\$0	\$0	\$422,211,424	\$8,789,015
331511	Iron Foundries	\$9,786,154,772	\$462,217,269	\$86,096,560	\$4,066,492	\$235,041,323	\$11,101,414
331512	Steel Investment Foundries	\$4,091,022,841	\$193,226,191	\$832,718,001	\$39,330,733	\$59,008,379	\$2,787,069
331513	Steel Foundries (except Investment)	\$3,451,310,647	\$163,011,461	\$1,520,040,544	\$71,794,183	\$158,529,911	\$7,487,646
331523	Nonferrous Metal Die-Casting Foundries	\$7,892,732,868	\$372,787,629	\$2,531,019,436	\$119,544,491	\$264,021,276	\$12,470,188
331524	Aluminum Foundries (except Die-Casting)	\$3,103,121,814	\$146,565,891	\$1,831,306,669	\$86,495,829	\$218,051,062	\$10,298,934

Table VII-9: Estimated Total Revenues and Profits for Industries Affected by the Proposed Revisions to the HCS, by Establishment Size

NAICS Code	Industry	All Entities		Small Entities		Very Small Entities (fewer than 20 Employees)	
		Revenues	Profits	Revenues	Profits	Revenues	Profits
331529	Other Nonferrous Metal Foundries (except Die-Casting)	\$2,738,832,777	\$129,359,880	\$1,269,865,133	\$59,977,960	\$184,739,645	\$8,725,578
339	Miscellaneous Manufacturing	\$157,410,019,449	\$9,456,508,594	\$39,530,013,204	\$1,919,889,733	\$14,517,096,167	\$741,894,194
339112	Surgical and Medical Instrument Manufacturing	\$41,727,828,702	\$3,059,643,748	\$4,254,912,087	\$311,986,403	\$919,970,207	\$67,455,729
339113	Surgical Appliance and Supplies Manufacturing	\$36,136,301,720	\$2,649,651,637	\$977,823,332	\$71,697,741	\$1,493,451,442	\$109,505,563
339114	Dental Equipment and Supplies Manufacturing	\$5,122,480,302	\$375,599,817	\$679,750,171	\$49,841,878	\$281,217,897	\$20,619,970
339115	Ophthalmic Goods Manufacturing	\$6,175,778,513	\$452,831,664	\$197,531,165	\$14,483,739	\$238,750,582	\$17,506,104
339116	Dental Laboratories	\$5,024,370,977	\$368,406,067	\$3,751,568,850	\$275,079,354	\$1,804,762,383	\$132,332,070
339910	Jewelry and Silverware Manufacturing	\$7,504,994,935	\$302,745,487	\$3,925,308,912	\$158,343,819	\$1,777,940,358	\$47,517,171
339920	Sporting and Athletic Goods Manufacturing	\$10,658,798,838	\$429,967,412	\$1,235,218,821	\$49,827,738	\$970,497,005	\$39,149,072
339930	Doll, Toy, and Game Manufacturing	\$1,720,555,223	\$69,405,820	\$1,298,334,418	\$52,373,771	\$357,636,551	\$14,426,772
339940	Office Supplies (except Paper) Manufacturing	\$3,320,217,162	\$133,934,902	\$460,233,465	\$18,565,450	\$259,199,969	\$10,455,919
339950	Sign Manufacturing	\$13,212,923,236	\$532,998,745	\$10,768,055,741	\$434,374,748	\$2,909,036,588	\$117,348,207
339991	Gasket, Packing, and Sealing Device Mfg.	\$7,540,016,634	\$304,158,235	\$2,504,878,488	\$101,044,793	\$439,494,549	\$17,728,858
339992	Musical Instrument Manufacturing	\$2,040,059,050	\$82,294,349	\$465,435,364	\$18,775,290	\$255,684,563	\$10,314,111
339993	Fastener, Button, Needle, and Pin Manufacturing	\$932,759,282	\$37,626,763	\$0	\$0	\$52,427,806	\$2,114,896
339994	Broom, Brush, and Mop Manufacturing	\$2,968,149,189	\$119,732,762	\$1,160,531,125	\$46,814,896	\$122,499,344	\$4,941,525
339995	Burial Casket Manufacturing	\$595,589,836	\$24,025,617	\$0	\$0	\$34,718,413	\$1,400,513
339999	All Other Miscellaneous Manufacturing	\$12,729,195,852	\$513,485,570	\$7,850,431,266	\$316,680,112	\$3,199,808,510	\$129,077,714
42	Wholesale Trade	\$8,241,112,357,137	\$187,764,000,889	\$2,029,694,592,065	\$46,557,861,792	\$662,069,497,910	\$15,930,366,430
423	Merchant Wholesalers, Durable Goods	\$3,730,586,842,837	\$78,224,194,326	\$1,038,998,940,330	\$22,996,072,728	\$358,307,048,518	\$8,191,349,278
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	\$227,956,291,687	\$5,659,037,892	\$34,060,394,933	\$845,552,734	\$12,491,750,129	\$310,108,955
423840	Industrial Supplies Merchant Wholesalers	\$76,784,521,382	\$2,369,037,938	\$26,894,452,293	\$829,776,323	\$12,377,652,116	\$381,888,523
424	Merchant Wholesalers, Nondurable Goods	\$4,510,525,514,300	\$109,539,806,563	\$990,695,651,735	\$23,561,789,065	\$303,762,449,392	\$7,739,017,152
424210	Drugs and Druggists' Sundries Merchant Wholesalers	\$993,553,873,870	\$34,478,605,779	\$75,561,309,955	\$2,622,151,336	\$19,231,035,837	\$667,361,198
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers	\$47,943,855,645	\$1,464,284,802	\$19,151,107,910	\$584,906,572	\$8,687,864,991	\$265,341,794
424690	Other Chemical and Allied Products Merchant Wholesalers	\$190,251,901,023	\$5,810,608,336	\$49,029,260,628	\$1,497,434,869	\$20,817,877,435	\$635,812,476
424710	Petroleum Bulk Stations and Terminals	\$553,795,115,137	\$5,343,134,660	\$116,687,155,895	\$1,125,822,836	\$19,778,343,816	\$190,825,725
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	\$589,029,156,042	\$5,683,080,283	\$110,304,296,920	\$1,064,239,637	\$21,107,021,411	\$203,645,093
424910	Farm Supplies Merchant Wholesalers	\$143,037,724,037	\$3,880,616,514	\$46,711,531,722	\$1,267,284,855	\$15,813,831,821	\$429,029,596
424950	Paint, Varnish, and Supplies Merchant Wholesalers	\$18,239,107,674	\$423,672,981	\$4,622,011,771	\$107,363,888	\$1,831,250,389	\$42,537,789
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	\$45,182,648,502	\$1,049,539,689	\$27,846,311,288	\$646,837,002	\$15,541,966,801	\$361,021,577

Table VII-9: Estimated Total Revenues and Profits for Industries Affected by the Proposed Revisions to the HCS, by Establishment Size

NAICS Code	Industry	All Entities		Small Entities		Very Small Entities (Fewer than 20 Employees)	
		Revenues	Profits	Revenues	Profits	Revenues	Profits
Total	Total	\$42,567,021,362,731	\$5,795,377,657,021	\$11,528,927,098,095	\$1,258,949,490,569	\$4,339,862,178,615	\$165,526,269,969

Source: U.S. DOI, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health based on U.S. Census Bureau, 2020a (Document ID 0231), U.S. Census Bureau, 2020b (Document ID 0232).

Table VII-10: Percentage of Establishments (or, for Training, Entities) Affected for Each Cost Provision in the Proposed Revisions to the HCS, by Industry

NAICS	NAICS Industry	Rule Familiarization - NAICS with Additional Costs[a]	Rule Familiarization - NAICS without Additional Costs	Training	Reclassification - Flammable Aerosols	Reclassification - Desensitized Explosives	Reclassification - Flammable Aerosols	Appendix
211120	Crude Petroleum Extraction	100%	0%	0%	0%	0%	0%	100%
211130	Natural Gas Extraction	100%	0%	50%	0%	0%	50%	100%
324110	Petroleum Refineries	100%	0%	50%	0%	0%	50%	100%
324121	Asphalt Paving Mixture and Block Manufacturing	100%	0%	0%	0%	0%	0%	100%
324122	Asphalt Shingle and Coating Materials Manufacturing	100%	0%	0%	0%	0%	0%	100%
324191	Petroleum Lubricating Oil and Grease Manufacturing	100%	0%	0%	0%	0%	0%	100%
324199	All Other Petroleum and Coal Products Manufacturing	100%	0%	0%	0%	0%	0%	100%
325110	Petrochemical Manufacturing	100%	0%	50%	0%	0%	50%	100%
325120	Industrial Gas Manufacturing	100%	0%	0%	0%	0%	0%	100%
325130	Synthetic Dye and Pigment Manufacturing	100%	0%	0%	0%	0%	0%	100%
325180	Other Basic Inorganic Chemical Manufacturing	100%	0%	0%	0%	0%	0%	100%
325193	Ethyl Alcohol Manufacturing	100%	0%	0%	0%	0%	0%	100%
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	100%	0%	0%	0%	0%	0%	100%
325199	All Other Basic Organic Chemical Manufacturing	100%	0%	0%	0%	0%	0%	100%
325211	Plastics Material and Resin Manufacturing	100%	0%	0%	0%	0%	0%	100%
325212	Synthetic Rubber Manufacturing	100%	0%	0%	0%	0%	0%	100%
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	100%	0%	0%	0%	0%	0%	100%
325311	Nitrogenous Fertilizer Manufacturing	100%	0%	0%	0%	0%	0%	100%
325312	Phosphatic Fertilizer Manufacturing	100%	0%	0%	0%	0%	0%	100%
325314	Fertilizer (Mixing Only) Manufacturing	100%	0%	0%	0%	0%	0%	100%
325320	Pesticide and Other Agricultural Chemical Manufacturing	100%	0%	50%	50%	0%	0%	100%
325411	Medicinal and Botanical Manufacturing	100%	0%	0%	0%	0%	0%	100%
325412	Pharmaceutical Preparation Manufacturing	100%	0%	50%	50%	0%	0%	100%
325413	In-Vitro Diagnostic Substance Manufacturing	100%	0%	0%	0%	0%	0%	100%

Table VII-10: Percentage of Establishments (or, for Training, Entities) Affected for Each Cost Provision in the Proposed Revisions to the HCS, by Industry

NAICS	NAICS Industry	Rule - Familiarization - NAICS with Additional Costs[a]	Rule - Familiarization - NAICS without Additional Costs	Training	Reclassification - Flammable Aerosols	Reclassification - Desensitized Explosives	Reclassification - Flammable Aerosols	Appendix
325414	Biological Product (except Diagnostic) Manufacturing	100%	0%	0%	0%	0%	0%	100%
325510	Paint and Coating Manufacturing	100%	0%	50%	50%	0%	0%	100%
325520	Adhesive Manufacturing	100%	0%	50%	50%	0%	0%	100%
325611	Soap and Other Detergent Manufacturing	100%	0%	50%	50%	0%	0%	100%
325612	Polish and Other Sanitation Good Manufacturing	100%	0%	50%	50%	0%	0%	100%
325613	Surface Active Agent Manufacturing	100%	0%	50%	50%	0%	0%	100%
325620	Toilet Preparation Manufacturing	100%	0%	50%	50%	0%	0%	100%
325910	Printing Ink Manufacturing	100%	0%	0%	0%	0%	0%	100%
325920	Explosives Manufacturing	100%	0%	50%	0%	50%	0%	100%
325991	Custom Compounding of Purchased Resins	100%	0%	0%	0%	0%	0%	100%
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing	100%	0%	0%	0%	0%	0%	100%
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	100%	0%	0%	0%	0%	0%	100%
326111	Plastics Bag and Pouch Manufacturing	0%	100%	0%	0%	0%	0%	0%
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	0%	100%	0%	0%	0%	0%	0%
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	0%	100%	0%	0%	0%	0%	0%
326121	Unlaminated Plastics Profile Shape Manufacturing	0%	100%	0%	0%	0%	0%	0%
326122	Plastics Pipe and Pipe Fitting Manufacturing	0%	100%	0%	0%	0%	0%	0%
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	0%	100%	0%	0%	0%	0%	0%
326140	Polystyrene Foam Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	0%	100%	0%	0%	0%	0%	0%
326160	Plastics Bottle Manufacturing	0%	100%	0%	0%	0%	0%	0%
326191	Plastics Plumbing Fixture Manufacturing	0%	100%	0%	0%	0%	0%	0%
326199	All Other Plastics Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
326211	Tire Manufacturing (except Retreading)	0%	100%	0%	0%	0%	0%	0%
326212	Tire Retreading	0%	100%	0%	0%	0%	0%	0%
326220	Rubber and Plastics Hoses and Belting Manufacturing	0%	100%	0%	0%	0%	0%	0%
326291	Rubber Product Manufacturing for Mechanical Use	0%	100%	0%	0%	0%	0%	0%
326299	All Other Rubber Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
327110	Pottery, Ceramics, and Plumbing Fixture Manufacturing	0%	100%	0%	0%	0%	0%	0%
327120	Clay Building Material and Refractories Manufacturing	0%	100%	0%	0%	0%	0%	0%
327211	Flat Glass Manufacturing	0%	100%	0%	0%	0%	0%	0%
327212	Other Pressed and Blown Glass and Glassware Manufacturing	0%	100%	0%	0%	0%	0%	0%
327213	Glass Container Manufacturing	0%	100%	0%	0%	0%	0%	0%

Table VII-10: Percentage of Establishments (or, for Training, Entities) Affected for Each Cost Provision in the Proposed Revisions to the HCS, by Industry

NAICS	NAICS Industry	Rule Familiarization - NAICS with Additional Costs[d]	Rule Familiarization - NAICS without Additional Costs	Training	Reclassification - Flammable Aerosols	Reclassification - Desensitized Explosives	Reclassification - Flammable Aerosols	Appendix
327215	Glass Product Manufacturing Made of Purchased Glass	0%	100%	0%	0%	0%	0%	0%
327310	Cement Manufacturing	0%	100%	0%	0%	0%	0%	0%
327320	Ready-Mix Concrete Manufacturing	0%	100%	0%	0%	0%	0%	0%
327331	Concrete Block and Brick Manufacturing	0%	100%	0%	0%	0%	0%	0%
327332	Concrete Pipe Manufacturing	0%	100%	0%	0%	0%	0%	0%
327390	Other Concrete Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
327410	Lime Manufacturing	0%	100%	0%	0%	0%	0%	0%
327420	Gypsum Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
327910	Abrasive Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
327991	Cut Stone and Stone Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
327992	Ground or Treated Mineral and Earth Manufacturing	0%	100%	0%	0%	0%	0%	0%
327993	Mineral Wool Manufacturing	0%	100%	0%	0%	0%	0%	0%
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	0%	100%	0%	0%	0%	0%	0%
331110	Iron and Steel Mills and Ferroalloy Manufacturing	0%	100%	0%	0%	0%	0%	0%
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	0%	100%	0%	0%	0%	0%	0%
331221	Roller Steel Shape Manufacturing	0%	100%	0%	0%	0%	0%	0%
331222	Steel Wire Drawing	0%	100%	0%	0%	0%	0%	0%
331313	Alumina Refining and Primary Aluminum Production	0%	100%	0%	0%	0%	0%	0%
331314	Secondary Smelting and Alloying of Aluminum	0%	100%	0%	0%	0%	0%	0%
331315	Aluminum Sheet, Plate, and Foil Manufacturing	0%	100%	0%	0%	0%	0%	0%
331318	Other Aluminum Rolling, Drawing, and Extruding	0%	100%	0%	0%	0%	0%	0%
331410	Nonferrous Metal (except Aluminum) Smelting and Refining	0%	100%	0%	0%	0%	0%	0%
331420	Copper Rolling, Drawing, Extruding, and Alloying	0%	100%	0%	0%	0%	0%	0%
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	0%	100%	0%	0%	0%	0%	0%
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	0%	100%	0%	0%	0%	0%	0%
331511	Iron Foundries	0%	100%	0%	0%	0%	0%	0%
331512	Steel Investment Foundries	0%	100%	0%	0%	0%	0%	0%
331513	Steel Foundries (except Investment)	0%	100%	0%	0%	0%	0%	0%
331523	Nonferrous Metal Die-Casting Foundries	0%	100%	0%	0%	0%	0%	0%
331524	Aluminum Foundries (except Die-Casting)	0%	100%	0%	0%	0%	0%	0%
331529	Other Nonferrous Metal Foundries (except Die-Casting)	0%	100%	0%	0%	0%	0%	0%
339112	Surgical and Medical Instrument Manufacturing	100%	0%	0%	0%	0%	0%	100%

Table VII-10: Percentage of Establishments (or, for Training, Entities) Affected for Each Cost Provision in the Proposed Revisions to the HCS, by Industry

NAICS	NAICS Industry	Rule Familiarization - NAICS with Additional Costs[a]	Rule Familiarization - NAICS without Additional Costs	Training	Reclassification - Flammable Aerosols	Reclassification - Desensitized Explosives	Reclassification - Flammable Aerosols	Appendix
339113	Surgical Appliance and Supplies Manufacturing	100%	0%	0%	0%	0%	0%	100%
339114	Dental Equipment and Supplies Manufacturing	100%	0%	0%	0%	0%	0%	100%
339115	Ophthalmic Goods Manufacturing	100%	0%	0%	0%	0%	0%	100%
339116	Dental Laboratories	100%	0%	0%	0%	0%	0%	100%
339910	Jewelry and Silverware Manufacturing	100%	0%	0%	0%	0%	0%	100%
339920	Sporting and Athletic Goods Manufacturing	100%	0%	0%	0%	0%	0%	100%
339930	Doll, Toy, and Game Manufacturing	100%	0%	0%	0%	0%	0%	100%
339940	Office Supplies (except Paper) Manufacturing	100%	0%	0%	0%	0%	0%	100%
339950	Sign Manufacturing	100%	0%	0%	0%	0%	0%	100%
339991	Gasket, Packing, and Sealing Device Manufacturing	100%	0%	0%	0%	0%	0%	100%
339992	Musical Instrument Manufacturing	100%	0%	0%	0%	0%	0%	100%
339993	Fastener, Button, Needle, and Pin Manufacturing	100%	0%	0%	0%	0%	0%	100%
339994	Broom, Brush, and Mop Manufacturing	100%	0%	0%	0%	0%	0%	100%
339995	Burial Casket Manufacturing	100%	0%	0%	0%	0%	0%	100%
339999	All Other Miscellaneous Manufacturing	100%	0%	0%	0%	0%	0%	100%
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%
423840	Industrial Supplies Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%
424210	Drugs and Druggists' Sundries Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%
424690	Other Chemical and Allied Products Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%
424710	Petroleum Bulk Stations and Terminals	0%	100%	0%	0%	0%	0%	0%
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	0%	100%	0%	0%	0%	0%	0%
424910	Farm Supplies Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%
424950	Paint, Varnish, and Supplies Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	0%	100%	0%	0%	0%	0%	0%

Source: U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

TABLE VII–11—CHARACTERISTICS OF INDUSTRIES AND LABELS/SDSS AFFECTED BY OSHA'S PROPOSED REVISIONS TO THE HCS^a

	Total	Percentage affected	Affected
Firms	6,077,430	1.91	115,758
Establishments	7,780,863	1.96	152,427
Relevant Employees	148,004,068	2.82	4,178,738
Labels Being Revised Due to Chemical Reclassification and Labels Revisions	1,512,219,200	63.55	961,053,993
Labels for Very Small Containers	147,599,473	17.21	25,394,066
Firms w/Warehoused Labels that Change	230	1.00	2.30
SDSS	1,519,506	94.40	1,434,377

Sources: U.S. Census Bureau, 2020a (Document ID 0231); U.S. Census Bureau, 2020b (Document ID 0232); U.S. Census Bureau, 2019a (Document ID 0227); BLS, 2020 (Document ID 0223); U.S. DOL, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Health.

Note: Due to rounding, data derived by applying the percentages shown in the table to the figures shown in the "Total" column may not be identical to the figures shown in the "Affected" column.

^a The data in this table are drawn from tables presented earlier in this PEA (for firms, establishments and employees, see Table VII–1; for labels and SDSS, see Table VII–5).

D. Health and Safety Benefits and Unquantified Positive Economic Effects

As part of the rulemakings that resulted in promulgation of the original HCS in 1983, and the 1987 updates, OSHA conducted research to identify and estimate expected health and safety benefits, as described in the preambles to those final rules (48 FR 53327–53329; 52 FR 31868–31869). Combining the 1983 and 1987 rulemakings, OSHA estimated that the HCS would prevent 31,841 non-lost-workday injuries and illnesses, 20,263 lost-workday injuries and illnesses, 6,410 chronic illnesses, and 4,260 fatalities (77 FR 17621). In the 2012 final rule to modify the HCS to conform with the GHS, OSHA estimated that compliance with those revisions to the HCS would result in additional health and safety benefits equal to one percent of the previously-estimated health and safety benefits—that is, they would result in the prevention of an additional 318 non-lost-workday injuries and illnesses, 203 lost-workday injuries and illnesses, 64 chronic illnesses, and 43 fatalities annually (77 FR 17620–17624).

Relative to the HCS rulemakings that resulted in the promulgation of final rules in 1983, 1987, and 2012, these proposed revisions to the HCS are incremental and minor. Accordingly, OSHA expects that the proposed revisions to the standard will result in more modest improvements in employee health and safety than the estimated benefits OSHA attributed to the earlier rulemakings. But OSHA expects that the promulgation of the proposed revisions to the HCS will result in an increased degree of health and safety for affected employees and a corresponding reduction in the annual numbers of injuries, illnesses, and fatalities associated with workplace exposures to hazardous chemicals.

Aligning with the GHS Rev. 7 will improve worker health and safety by ensuring the provision of more and better hazard information to employers and workers. For example, OSHA anticipates that the improved criteria for aerosols and flammable gases and the new hazard class for desensitized explosives, along with updated precautionary statements, will better differentiate the hazards associated with those chemicals. In addition, the proposed released-for-shipment provisions will remove the risk of injury and chemical exposures for employees who previously would have confronted the possibility of, for example, having to break down pallets of sealed, shrink-wrapped, packaged containers to replace labels when new hazards were identified.

Although OSHA expects that the proposed revisions to the HCS would reduce injuries, illnesses, and fatalities, the limited scope and nature of the changes being proposed have led OSHA to a preliminary determination that it cannot reasonably quantify an estimate of how many injuries, illnesses, and fatalities would be prevented. As the agency noted in the 2012 FEA, any assessment of benefits that are incremental to the original estimated benefits, *e.g.*, benefits associated with minor improvements to an existing standard, broaden the range of uncertainty associated with the original estimates (77 FR 17621).²⁵ OSHA

²⁵ As described above, OSHA estimated that the 2012 revisions to the HCS would result in benefits equal to one percent of the health and safety benefits previously estimated for the standard (77 FR 17620–17624). In the 2012 rulemaking, OSHA and stakeholders collectively noted the considerable uncertainty inherent in estimating benefits that are additional (incremental) to the set of benefits associated with the original rule (see 77 FR 17620–17624). The agency stated: "OSHA believes that a reasonable range for the magnitude of the health and safety benefits resulting from the

invites interested parties to provide comments and evidence on how the proposed revisions to the HCS are likely to affect worker safety and health.

In addition to the aforementioned health and safety benefits, OSHA expects that the proposed revisions to the HCS would result in other positive economic effects. For example, being better aligned with the GHS would help facilitate international trade, thereby enhancing competition, increasing export opportunities for U.S. businesses, reducing costs for imported products, and generally expanding the selection of chemicals and products available to U.S. businesses and consumers. As a result of the direct savings expected to result from better harmonization and the associated increase in international competition, prices for the affected chemicals and products, and the corresponding goods and services that use them, should decline, even if only to a limited extent.

Similarly, better alignment between the HCS and the GHS would have the additional benefit of meeting the international goals for adoption and implementation of the GHS that have been supported by the U.S. government.²⁶ Maintaining alignment with the GHS in U.S. laws and policies through appropriate legislative and

proposed revisions would be between 0.5 percent and 5 percent of the benefits associated with the current HCS." (77 FR 17621 (n 14)). In addition, OSHA stated in the 2012 FEA that "[i]t is conceivable that actual benefits might be somewhat lower, but because the GHS is expected to result, in some situations, in more timely and appropriate treatment of exposed workers, OSHA expects that actual benefits may be larger, perhaps several times larger." (77 FR 17621)

²⁶ The EU, Canada, Australia, and New Zealand have also indicated that they are proposing updates to align with the 7th revision to the GHS (Report of the Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals on its thirty-fifth session ST/SG/AC.10/C.4/7, Document ID 0040).

regulatory action was anticipated by the U.S. when it supported international mandates regarding the GHS in the Intergovernmental Forum on Chemical Safety, the World Summit on Sustainable Development, and the United Nations. It is also consistent with the established goals of the Strategic Approach to International Chemical Management that the U.S. helped to craft.²⁷

E. Technological Feasibility

In accordance with the OSH Act, OSHA is required to demonstrate that occupational safety and health standards promulgated by the agency are technologically feasible. A standard is technologically feasible if the protective measures it requires already exist, can be brought into existence with available technology, or can be created with technology that can reasonably be expected to be developed. See *Lead I*, 647 F.2d at 1272.

OSHA has reviewed the requirements that would be imposed by the proposed rule and has assessed their technological feasibility. As a result of this review, OSHA has preliminarily determined that compliance with the requirements of the rule is technologically feasible for all affected industries.

The proposed revisions to OSHA's HCS would require manufacturers and importers to reclassify aerosols, desensitized explosives, and flammable gases in accordance with the new classification criteria and make corresponding revisions to SDSs and labels. Compliance with these requirements would mainly involve revisions to the presentation of information and is not expected to involve any technological obstacles.

The proposed changes to the requirements for the labeling of very small containers, which would eliminate full labeling requirements for some containers with a volume capacity of 3 ml or less, is expected to address current feasibility issues related to labeling these small containers. When a label would interfere with the normal use of the container, and it is not feasible to use pullout labels, fold-back labels, or tags containing full label information, the proposal would require the container to bear only the product identifier, which could be etched onto the container itself. Similarly, the proposed released-for-shipment provisions would alleviate employer concerns regarding the practicability of

breaking down pallets of sealed, shrink-wrapped packaged containers to replace labels when new hazards are identified. OSHA requests public comment on any employer concerns associated with the proposed provision for labeling very small containers or with the proposed provision addressing the relabeling of containers that have been released for shipment.

OSHA has preliminarily determined that compliance with all of the requirements of the proposed revisions to the HCS can be achieved with readily and widely available technologies. No new technologies are required for compliance with the proposed modifications to the HCS. Therefore, OSHA believes that there are no technological constraints associated with compliance with any of the proposed revisions to the HCS. OSHA invites comment on these preliminary findings of technological feasibility.

F. Compliance Costs and Cost Savings Introduction

This section presents OSHA's estimates of the costs and cost savings expected to result from the proposed revisions to the HCS. The estimated costs and cost savings are based on employers achieving full compliance with the new requirements of the proposed rule. They do not include prior costs and cost savings associated with firms whose current practices are already in compliance with the proposed requirements (where prior compliance is possible).

The estimated costs and cost savings resulting from the proposed revisions to the HCS consist of five main categories: (1) The cost of revising SDSs and labels for select hazardous chemicals to reflect chemical reclassifications (per proposed changes to appendix B) and to conform to language criteria in precautionary statements and other mandatory language (per proposed changes to appendices C and D); (2) the cost of management familiarization and other management-related costs (associated with all of the proposed revisions to the standard); (3) the cost of training employees as necessitated by the proposed changes to the HCS (see existing 29 CFR 1910.1200(h)(1)); (4) the cost savings due to the new released-for-shipment provision (proposed revisions to 29 CFR 1910.1200(f)(11)); and (5) the cost savings from limiting labeling requirements for certain very small containers (proposed 29 CFR 1910.1200(f)(12)). The first three categories are considered to be one-time costs and the last two categories are cost savings that would accrue to employers

annually. Although OSHA has preliminarily determined that these are the only elements of the proposed revisions to the HCS that are expected to result in more than *de minimis* costs or cost savings, OSHA requests comments on whether any other proposed changes to the standard could cause employers to incur costs or obtain cost savings.

The estimated compliance costs do not include any indirect costs or impacts that may result from the reclassification or relabeling of chemicals and products already subject to the HCS, such as possible changes in production or in demand for products. Theoretically, such impacts, if any, with regard to possible changes in the uses and applications of affected chemicals, could result in costs or cost savings. OSHA expects that such effects, if any, will not be significant, but the agency would welcome input from stakeholders. This is consistent with the determination OSHA made with regard to reclassification costs for the 2012 final rule (77 FR 17625).

In order to present compliance costs and cost savings on a consistent and comparable basis across various regulatory activities, they are expressed in annualized terms. Annualized costs and cost savings represent the most appropriate measure for assessing the longer-term potential impacts of this proposed rulemaking and for purposes of comparing net costs across diverse regulations with a consistent metric. In addition, annualized net costs are often used for accounting purposes to assess the cumulative net costs of regulations on the economy or specific parts of the economy across different regulatory programs or across years.

As presented in this PEA (unless otherwise specified), a seven percent discount rate was applied to costs and cost savings arising in future years to calculate the present value of these costs and cost savings for the base year in which the standard becomes effective, and the same discount rate was then applied to the total present value costs, over a 10-year period, to calculate the annualized cost.²⁸ The economic effects

²⁸ OSHA annualized costs for this proposed rule over a 10-year period in accordance with Executive Order 13563, which directs agencies "to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible." In addition, OMB Circular A-4 states that analysis should include all future costs and benefits using a "rule of reason" to consider for how long it can reasonably predict the future and limit its analysis to this time period. The 10-year annualization period is the one OSHA has traditionally used in rulemakings. Note, however, that OSHA used a 20-year annualization period for the 2012 HCS final rule (77 FR 17625), but that was

²⁷ <https://2009-2017.state.gov/e/oes/eqt/chemicalpollution/83012.htm> (SAICM, 2006, Document ID 0039).