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May 18, 2021

Ms. Maureen Ruskin, Acting Director
Directorate of Standards and Guidance
U.S. Occupational Safety and Health Administration
200 Constitution Avenue NW
Washington, DC 20210

Re: Proposed Rule, Hazard Communication Standard (Docket ID OSHA-2019-0001-0283)

Dear Ms. Ruskin:

The American Petroleum Institute (API) is pleased to submit the comments below to the U.S. Occupational Safety and Health Administration on the 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."* API represents all segments of America's oil and natural gas industry. Our more than 600 members produce, process and distribute most of the nation's energy. The industry supports more than ten million U.S. jobs and is backed by a growing grassroots movement of millions of Americans.

API members are regulated under existing U.S. hazard communication programs, and implementation of the GHS directly affects API members. Further, many API members transport petroleum substances and products around the world and support the global harmonization of appropriate hazard communication requirements. This includes support for consistent and appropriate adoption of the GHS by regulatory entities in the U.S. and other competent authorities around the world.

As a general principle, API encourages OSHA to modify the HCS to align it with the GHS for workplace chemicals by adhering to the language and intent of the GHS, as negotiated at the UN, with minimal country–specific deviations.

API's main comments and requests include, but are not limited to, the following:

- The HCS introduces several terms ('gas', 'liquid', 'solid', 'date chemical is released for shipping', etc.) that have not been harmonized through the GHS process. API opposes the use of non-harmonized terms and does not consider them appropriate in country implementation of hazard communication standards.
- The API litigation settlement guidance regarding the HCS 2012 application to petroleum streams – as memorialized in the March 4, 2014, OSHA Letter of Interpretation to API[1], and reproduced in OSHA Directive CPL

[1] https://www.osha.gov/laws-regs/standardinterpretations/2014-03-04-2

02-02-079, Effective Date July 9, 2015: Inspection Procedures for the Hazard Classification Standard (HCS 2012), Appendix D, Petroleum Streams3 – should remain in effect in any revision to the HCS.

- API requests that GHS criteria for determining health and environmental hazards remain test method neutral. This is particularly important for petroleum substances, many of which have limited solubility in aqueous solution and are also UVCBS, resulting in potential limitations to the applicability domain of some tests.

In addition to the main comments and requests above, API has provided specific comments and requests on various aspects of the HCS that were captured in both the Preamble and the redlines. In order to present these most clearly and efficiently, a tabular form Is used below.

OSHA Proposed Revision/Change	API Comments	API Requests
(c) Definitions **"*Bulk shipment*" means any hazardous chemical transported where the mode of transportation (vehicle) comprises the immediate container (i.e. contained in tanker truck, rail car, or intermodal container).** **"*Combustible dust*" means finely divided solid particles of a substance or mixture that are liable to catch fire or explode on ignition when dispersed in air or other oxidizing media.** **"*Gas*" means a substance which: at 122°F (50°C) has a vapor pressure greater than 43.51 PSI (300 kPa) (absolute); or is completely gaseous at 68°F (20°C) at a standard pressure of 14.69 PSI (101.3 kPa).** **"*Immediate outer package*" means the first package enclosing the container of hazardous chemical.** **"*Liquid*" means a substance or mixture which at 122°F (50°C) has a vapor pressure of not more than 43.51 PSI (300 kPa (3 bar)), which is not completely gaseous at 68°F (20°C) and at a standard pressure of 101.3 kPa, and which has a melting point or**	OSHA has added several new definitions including ''bulk shipment, 'solid', 'liquid', and 'gas'. There is also a definition for 'combustible dust' which aligns with the UN GHS. API notes that the definition of combustible dust now aligns with the GHS, and API now agrees this is appropriate. Historically, API had voiced concerns that combustible dust had not been harmonized within GHS and that standard definitions, such as that by NFPA, had not been used (OSHA-2016-0005-0029).	Any definitions used should align with the GHS. If a GHS definition is not available, the term should not be used. At the very least, terms that are not harmonized within GHS should align with generally recognized and accepted practice and OSHA should be transparent that the definition has not yet been harmonized in GHS and could change once harmonized. API is pleased to see that the combustible dust issue has been ultimately resolved within the context of the GHS and suggests the same for the terms 'bulk shipment'. 'solid, 'liquid', 'gas', and others. '

OSHA Proposed Revision/Change	API Comments	API Requests
initial melting point of 68 °F (20°C) or less at a standard pressure of 14.69 PSI (101.3 kPa). A viscous substance or mixture for which a specific melting point cannot be determined shall be subjected to ASTM D 4359-90 (2019) (Standard Test Method for Determining Whether a Material Is a Liquid or a Solid) (incorporated by reference; see §1910.6); or to the test for determining fluidity (penetrometer test) prescribed in the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), section 2.3.4 of Annex A (2019) (incorporated by reference; see §1910.6). **"*Physician or other licensed health care professional (PLHCP)*" means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows the individual to independently provide or be delegated the responsibility to provide some or all of the health care services referenced in paragraph (i) of this section.** **"*Released for shipment*" means a chemical that has been packaged and labeled in the manner in which it will be distributed or sold.** **"*Solid*" means a substance or mixture which does not meet the definitions of liquid or gas.**		
(d) (1) Hazard classification. 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	Common examples where this would seem to make sense include reactants mixed in the formation of epoxy resins and the addition of water to cement. However, further examples from OSHA would be	API requests greater clarity and more examples. It is unclear, for example, if exhaust hazards would have to be classified for gasoline and diesel. It is also unclear if such exhaust hazards would have to be

OSHA Proposed Revision/Change	API Comments	API Requests
being classified **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**.	helpful. Additionally, Is unclear If the HCS would require chemicals/emissions from downstream use under the General Duty Clause. As proposed, this seems extremely broad without some qualifications. For example, it is very difficult to list all hazards associated with reactions for acids or bases, etc. with other chemicals under normal conditions of use.	listed under the General Duty Clause of the HCS. While such information may be provided In Section 11, it now seems that this information must be provided In Section 2. OSHA should ensure that any required hazard classification for changes in physical form or as a result of a chemical reaction will apply only narrowly to conditions of use where it is intended that the chemical will be used in a reaction with water and/or other chemicals.
Released for shipment concept (c) definition "**Released for shipment" means a chemical that has been packaged and labeled in the manner in which it will be distributed or sold.** (f) labeling (f)(1) Labels on shipped containers. 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 **and hazards resulting from a reaction with other chemicals under normal conditions of use** do not have to be addressed on the container. Where the chemical manufacturer, or importer, or **distributor** is required to label, tag or mark the following shall be provided: (i) Product identifier;	While this concept might make sense for some items (e.g. so that shrink wrapped pallets do not need to be broken down to be relabeled), it is problematic for others. This proposed change would require all labels to be revised. OSHA envisions that label and SDS changes could be achieved seamlessly during the normal cycle of change during the phase-in period. However, it is not clear that this is the case. Also unclear is what a company should do if the date is unknown or if the company does not use the 'released-for-shipment' concept. It is not clear why this label element is necessary for increasing worker protection. For example, It Is not clear that it is common practice for chemicals to be held for long periods of time prior to shipping during	This element should be removed or made voluntary, as it is not part of the GHS. EPA made this requirement for some products with a long shelf life, but this is very cumbersome for products that do not have a long shelf-life. API believes that GHS implementation in the U.S. should be synchronized among all responsible agencies. API recommends that OSHA work closely with other government agencies to ensure consistent and timely implementation of the GHS and alignment to the UN-endorsed version of the GHS. A coordinated effort on hazard communication activities in the U.S. is needed, and it should include collaboration among the Environmental

OSHA Proposed Revision/Change	API Comments	API Requests
(ii) Signal word; (iii) Hazard statement(s); (iv) Pictogram(s); (v) Precautionary statement(s); and, (vi) Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party; and **(vii) Date chemical is released for shipment.** (f)(11) **Release for shipment**. 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. **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**. 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.	which substantive label changes might be anticipated to occur. Additionally, OSHA does not require chemicals that have already been released for shipment and held prior to distribution to have label changes. The requested label changes may also conflict with US EPA label requirements.	Protection Agency (EPA), Coast Guard Consumer Product Safety Commission (CPSC), OSHA, Department of Transportation (DOT), Department of State, and United State Trade Representative (USTR).
(f)(5) Transportation. **(ii) The label for bulk shipments of hazardous chemicals may be on the immediate container or may be**	API recognizes that this revision codifies OSHA guidance on bulk shipments. The guidance was issued in conjunction with DOT. The	This appears to be the same guidance with PHMSA labelling bulk shipments. Aside from it being

OSHA Proposed Revision/Change	API Comments	API Requests
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. **(iii) 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 of this section for the same hazard is not required on the label.**	clarification about pictograms was also previous guidance	outside of the GHS, API has no concerns with this language.
(f)(12) Small container labelling. **(i) This paragraph (f)(12) applies where the chemical manufacturer, importer, or distributor can demonstrate that it is not feasible to use pull-out labels, fold-back labels, or tags containing the full label information required by paragraph (f)(1) of this section. (ii) 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:** **(A) Product identifier;** **(B) Pictogram(s);** **(C) Signal word;** **(D) Chemical manufacturer's name and phone number; and** **(E) A statement that the full label information for the hazardous chemical is provided on the immediate outer package.** **(iii) For a container less than or equal to 3 ml capacity, where the chemical manufacturer, importer, or**	The addition of small container labeling has been requested many times. This incorporates some OSHA letters of interpretation. It defines small container as ≤ 100 ml. It also aligns with Canada by including very small container requirements for ≤ 3 ml.	This would also likely impact laboratory samples. However, API has no concerns.

OSHA Proposed Revision/Change	API Comments	API Requests
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. **(iv) For all small containers covered by paragraph (f)(12)(ii) or (iii) of this section, the immediate outer package must include:** **(A) The full label information required by paragraph (f)(1) of this section for each hazardous chemical in the immediate outer package. The label must be not be removed or defaced, as required by paragraph (f)(9) of this section.** **(B) A statement that the small container(s) inside must be stored in the immediate outer package bearing the complete label when not in use.**		
Container labeling • electronic labeling	Electronic labeling is only discussed in the preamble. This is a topic of discussion at the UNSCEGHS. Additionally, API has previously provided information to OSHA on considerations related to digital (electronic) labelling that are still current and so are recapitulated below (OSHA-2016-0005-0051): Sector differences may be a primary issue with digital labeling/information. Because industrial workplaces often do not allow mobile phones and other electronic devices in work areas, digital labeling in the industrial workplace sector would need careful consideration.	Electronic labelling should continue to be optional. Further stakeholder engagement on electronic labeling by OSHA would likely be beneficial for the regulatory and regulated community and other stakeholders.

OSHA Proposed Revision/Change	API Comments	API Requests
	• Proposing any additional documents or information beyond a traditional container label and SDS would warrant serious consideration. Requiring, recommending, or mandating digital hazard information would be a substantial change to the GHS. It would impose additional costs, but potential benefits are not clear. For the workplace industrial setting, there is not a demonstrated need for material beyond the SDS (which already can be electronic and electronically searchable) and container label. • Discussion of parallel use, complementary use, or alternative use should take into account sector differences. Using digital hazard information in the transport phase could be helpful for products in transit; however, developing an appropriate approach would require collaboration with the UN Sub-Committee of Experts on the Transport of Dangerous Goods (UNSCETDG). • Any digital label or digital hazard information would need to be consistent with the GHS container label content. It should have signal word, hazard statement(s), precautionary statement(s), and pictograms. • Information layout was a discussion in the initial GHS and then was only addressed at a general level of detail. Standardizing or mandating label	

OSHA Proposed Revision/Change	API Comments	API Requests
	information layout is challenging and could have cultural and regulatory implications. Even for SDSs, only a high-level outline of sections/information is in the GHS. • Any change to the GHS definition of label would be problematic. It might be better to add additional definitions such as for labeling, digital label(ing), parallel label(ing), complementary label(ing), alternative label(ing), container label, digital hazard information, etc. • Any digitalization effort should not aim to substantially change the existing GHS labeling elements and philosophy, but rather should complement the existing GHS.	
(g) SDS (g)(10) Safety data sheets may be kept in any form, including **as** operating procedures, and may be **stored in such a way** to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in their work area(s).	The original intent of paragraph (g)(10) seems to be to allow employers alternatives to SDSs within a plant site. Alternatives to SDSs, such as written operating procedures and manuals, are generally permitted. Because SDSs now have a standardized format and are specific to individual hazardous chemicals, they are not permitted to be designed to cover groups of hazards, as currently provided in paragraph (g)(10). Therefore, OSHA is proposing a change to paragraph (g)(10) that would allow SDSs to be stored, rather than designed, in a way to cover groups of hazardous chemicals in a work area. This paragraph (g)(10) refers to SDS storage only. OSHA	API requests further clarification by OSHA of the storing language.

OSHA Proposed Revision/Change	API Comments	API Requests
	believes that this change would allow employers flexibility in how they keep SDSs in the workplace while also ensuring that the mandatory 16-section SDS is maintained.	
(i) Trade secrets (1) The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name, other specific identification of a hazardous chemical, or the exact percentage (concentration) **or concentration range** of the substance in a mixture, **from section 3** of the safety data sheet, provided that: (iii) The safety data sheet indicates that the specific chemical identity and/or **concentration or concentration range** of composition is being withheld as a trade secret; **(iv) If the concentration or concentration range is being claimed as a trade secret then the safety data sheet provides the ingredient's concentration as one of the prescribed ranges below in paragraphs** **(i)(1)(iv)(A) through (M) of this section.** **(A) From 0.1% to 1%;** **(B) From 0.5% to 1.5%;** **(C) From 1% to 5%;** **(D) From 3% to 7%;** **(E) From 5% to 10%;** **(F) From 7% to 13%;** **(G) From 10% to 30%;** **(H) From 15% to 40%;** **(I) From 30% to 60%;**	OSHA is proposing an approach to allow concentration ranges to be claimed as a trade secret. While the proposed approach aligns with Canada, the USA has never had prescribed concentration ranges on SDSs.	API has no concerns with this change.

OSHA Proposed Revision/Change	API Comments	API Requests
(J) From 45% to 70%; **(K) From 60% to 80%;** **(L) From 65% to 85%; and** **(M) From 80% to 100%.** **(v) The prescribed concentration range used must be the narrowest range possible. If the exact concentration range falls between 0.1% and 30% and does not fit entirely into one of the prescribed concentration ranges, a single range created by the combination of two applicable consecutive ranges (e.g., between (i)(1)(iv) (A) and (G)) may be disclosed instead, provided that the combined concentration range does not include any range that falls entirely outside the exact concentration range in which the ingredient is present.**		
Effective dates (j) • 1 year substances • 2 years mixtures	OSHA is proposing a tiered compliance approach with 1 year for substances and 2 years for mixtures. A tiered approach to implementation with substances preceding mixtures is common due to the rationale that base substances must be classified before mixtures.	A tiered approach to implementation should used with 2 years for substances and 3 years for mixtures.
Appendix A **A.0.1.3 Where impurities, additives or individual constituents of a substance or mixture have been identified and are themselves classified, they should be taken into account during classification if they exceed the cut-**	OSHA added this paragraph. It seems aligned with the UN GHS and the API litigation settlement (e.g. March 4, 2014, OSHA Letter of Interpretation to API[2], and reproduced in OSHA Directive CPL 02-02-079, Effective Date July 9, 2015: Inspection Procedures for the Hazard	API supports these revisions and notes they are in alignment with UN GHS and the API litigation settlement.

[2] https://www.osha.gov/laws-regs/standardinterpretations/2014-03-04-2

OSHA Proposed Revision/Change	API Comments	API Requests
off value/concentration limit for a given hazard class	Classification Standard (HCS 2012), Appendix D, Petroleum Streams)..	
Appendix A OSHA has updated all the health hazard definitions in Appendix A Acute toxicity refers to ~~those~~ **serious** adverse **health** effects **(i.e., lethality)** occurring **following after a single or short-term** oral, ~~or~~ dermal, ~~**administration of a single dose of a substance, or multiple doses given within 24**~~ **hours** or ~~an~~ inhalation ~~**exposure of 4 hours**~~ **to a substance or mixture.** A.2.1.1 Skin corrosion ~~**is**~~ **refers to** the production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis **occurring after exposure to a substance or mixture, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia, and scars. Histopathology should be considered to evaluate questionable lesions.** Skin irritation ~~**is**~~ **refers to** the production of reversible damage to the skin **occurring after exposure to a substance or mixture** ~~**following the application of a test substance for up to 4 hours**~~**.** A.3.1.1 Serious eye damage ~~**is**~~ **refers to** the production of tissue damage in the eye, or serious physical decay of	The proposed HCS health hazard definitions align with the UN GHS updated definitions. API welcomes the ongoing work of the correspondence group on non-animal test methods. The U.S. government should remain involved in these discussions, and U.S. agencies (e.g., OSHA, EPA, DOT) should continue to coordinate on these issues. It is also important that the U.S. government continue to keep the regulated community and other stakeholders informed and provide opportunities for input on these issues. We expect that additional stakeholders will participate and provide input once they are aware of the work of the correspondence group and its potential impacts. OSHA should maximize transparency in order to facilitate this input. As this work proceeds, it will be important to keep in mind that a fundamental principle of the GHS is that the GHS criteria for determining health and environmental hazards are test method neutral, allowing different approaches. Many in vitro tests have a domain of applicability and will likely not be suitable for all substances. It is critical to the continued widespread adoption and success of the GHS that animal testing, structure activity relationship analysis, etc. remain part of the GHS.	API supports these revisions and notes they are in alignment with UN GHS. API requests that GHS criteria for determining health and environmental hazards remain test method neutral. This is particularly important for petroleum substances, many of which have limited solubility in aqueous solution and are also UVCBS, resulting in potential limitations to the applicability domain of some tests.

OSHA Proposed Revision/Change	API Comments	API Requests
vision, **which is not fully reversible, occurring after exposure of the eye to a substance or mixture**. ~~**following application of a test substance to the anterior surface of the eye, which is not fully reversible within 21 days of application.**~~ Eye irritation ~~**is**~~ **refers to** the production of changes in the eye, **which are fully reversible, occurring after exposure of the eye to a substance or mixture** ~~**following the application of test substance to the anterior surface of the eye, which are fully reversible within 21 days of application**~~. A.4.1.1 Respiratory ~~**sensitizer**~~ **sensitization** ~~**means a chemical that will lead**~~ **refers** to hypersensitivity of the airways ~~**following**~~ **occurring after** inhalation of ~~**the chemical**~~ **a substance or mixture**. Skin ~~**sensitizer**~~ **sensitization** ~~**means a chemical that will lead**~~ **refers** to an allergic response ~~**following**~~ **occurring after** skin contact **with a substance or mixture**. **A.5.1.1 Germ cell mutagenicity refers to heritable gene mutations, including heritable structural and numerical chromosome aberrations in germ cells occurring after exposure to a substance or mixture.** ~~***Carcinogen***~~ ***Carcinogenicity*** ~~**means**~~ **refers** ~~**a substance or a mixture of substances which induce**~~ **to the induction of** cancer or **an** increase **in the** ~~**its**~~ incidence **of cancer occurring**	Non-animal testing should be one part of the GHS classification criteria, but not become mandatory or a preferred method. Jurisdictions differ in non-animal testing policies and mandates, and not all substances (e.g., petroleum substances) will likely be compatible with nonanimal methods. While the GHS should align with advancements in technology, the GHS Purple Book should allow validated/recognized testing and good quality data but remain test method neutral.	

OSHA Proposed Revision/Change	API Comments	API Requests
after exposure to a substance or mixture. A.7.1.1 Reproductive toxicity **~~includes~~ refers** to adverse effects on sexual function and fertility in adult males and females, as well as **adverse effects on development of the offspring~~.~~ ~~D~~evelopmental toxicity in the offspring, occurring after exposure to a substance or mixture.** Some reproductive toxic effects cannot be clearly assigned to either impairment of sexual function and fertility or to developmental toxicity. Nonetheless, **~~chemicals~~ substances and mixtures** with these effects shall be classified as reproductive toxicants. *Specific target organ toxicity - single exposure, (STOT-SE)* **~~means~~ refers to** specific, non-lethal **~~target organ toxicity~~ toxic effects on target organs occurring after ~~arising from~~** a single exposure to a **substance or mixture ~~chemical~~** Specific target organ toxicity - repeated exposure (STOT-RE) **~~means~~ refers** to specific **toxic effects on** target organs **~~toxicity arising from~~ occurring after** repeated exposure to a substance or mixture. A.10.1.12 Aspiration **hazard ~~toxicity~~ ~~includes~~ refers** to severe acute effects such as chemical pneumonia, **~~varying degrees of~~** pulmonary injury or death **~~following~~ occurring after** aspiration **of a substance or mixture.**		

OSHA Proposed Revision/Change	API Comments	API Requests
A.10.1.2 Aspiration means the entry of a liquid or solid chemical directly through the oral or nasal cavity, or indirectly from vomiting, into the trachea and lower respiratory system.		
Appendix A – Acute Toxicity **While some in vivo methods determine LD50/LC50 values directly, other newer in vivo methods (e.g., using fewer animals) consider other indicators of acute toxicity, such as significant clinical signs of toxicity, which are used by reference to assign the hazard category.** **In cases where data from human experience (i.e., occupational data, data from accident databases, epidemiology studies, clinical reports) is also available, it should be considered in a weight of evidence approach consistent with the principles described in A.0.3.**		API supports these revisions and notes they are in alignment with UN GHS.
Appendix A – Acute Toxicity Acute toxicity - corrosive **A.1.2.4 In addition to classification for inhalation toxicity, if data are available that indicates that the mechanism of toxicity was corrosivity of the substance or mixture, the classifier must consider if the chemical is corrosive to the respiratory tract. Corrosion of the respiratory tract is defined as destruction of the respiratory tract tissue after a single, limited period of exposure analogous to skin corrosion; this includes destruction of the mucosa. The corrosivity evaluation could be based on expert judgment using such evidence as: human and**		API supports these revisions and notes they are in alignment with UN GHS.

OSHA Proposed Revision/Change	API Comments	API Requests
animal experience, existing (in vitro) data, pH values, information from similar substances or any other pertinent data. **A.1.2.4.1 If the classifier determines the chemical is corrosive to the respiratory tract and data are available that indicate that the effect leads to lethality, then the chemical must be labelled with the hazard statement "corrosive to the respiratory tract."** **A.1.2.4.2 If the classifier determines the chemical is corrosive to the respiratory tract and the effect does not lead to lethality, then the chemical must be addressed in the Specific Target Organ Toxicity hazard classes (see A.8 and A.9).**		
Appendix A A.2 SKIN CORROSION/IRRITATION A.2.1.2 Skin corrosion/irritation shall be classified using a tiered approach as detailed in figure A.2.1. Emphasis shall be placed upon existing human data (See A.0.2.6), followed by **existing animal data, followed by in vitro data and then** other sources of information. A.2.3.1 **A tiered approach to the evaluation of initial information shall be used (Figure A.2.1) recognizing that not all elements may be relevant.** A.2.3.~~4~~**87 The tiered approach explains how to organize existing information on a substance and to make a weight of evidence decision**	This chapter has been updated to align with UN GHS Revision 7. It incorporates the updated tier approach, including the revised schematic. It has extensive updates, not all of which are depicted in the redlines at left.	API supports these revisions and notes they are in alignment with UN GHS.

OSHA Proposed Revision/Change	API Comments	API Requests
about hazard assessment and hazard classification (ideally without conducting new animal tests). Although information might be gained from the evaluation of single parameters within a tier, consideration should be given to the totality of existing information and making an overall weight of evidence determination. This is especially true when there is conflict in information available on some parameters. [a] Existing human or animal data could be derived from single or repeated exposure(s), for example in occupational, consumer, transport or emergency response scenarios; or from purposely-generated data from animal studies conducted according to validated and internationally accepted test methods. Although human data from accident or poison center databases can provide evidence for classification, absence of incidents is not itself evidence for no classification as exposures are generally unknown or uncertain; [d] Evidence from studies using validated protocols with isolated human/animal tissues or other, non-tissue-based, though validated, protocols should be assessed. Examples of internationally accepted validated test methods for skin corrosion include OECD Test Guidelines 430 (Transcutaneous Electrical Resistance Test (TER)), 431(Human Skin Model Test), and 435 (Membrane Barrier Test Method). An example of a validated internationally		

OSHA Proposed Revision/Change	API Comments	API Requests
accepted in vitro test method for skin irritation is OECD Test Guideline 439 (Reconstructed Human Epidermis Test Method); [e] Measurement of pH alone may be adequate, but assessment of acid or alkali reserve (buffering capacity) would be preferable. Presently there is no validated and internationally accepted method for assessing this parameter; [f] All information that is available must be considered and an overall determination made on the total weight of evidence. This is especially true when there is conflict in information available on some parameters. Expert judgment should be exercised prior to making such a determination. Negative results from applicable validated skin corrosion/irritation in vitro tests are considered in the total weight of evidence evaluation. A.2.4.1.2 When considering testing of the mixture, classifiers must use a tiered approach as included in the criteria for classification of substances for skin corrosion and irritation to help ensure an accurate classification, as well as to avoid unnecessary animal testing. In the absence of any other information, a mixture is considered corrosive (Skin Category 1) if it has a pH ≤ 2 or a pH ≥ 11.5. However, if consideration of acid/alkaline reserve suggests the mixture may not be corrosive despite the low or high pH value, then further evaluation may be necessary.		

OSHA Proposed Revision/Change	API Comments	API Requests
Note : Where data are available and the sub-categories of skin Category 1 (corrosive) are used, the sum of all ingredients of a mixture classified as sub-category 1A, 1B or 1C respectively, must each be ≥5% in order to classify the mixture as either skin sub-category 1A, 1B or 1C. Where the sum of 1A ingredients is < 5% but the sum of 1A+1B ingredients is ≥5%, the mixture must be classified as sub-category 1B. Similarly, where the sum of 1A + 1B ingredients is < 5% but the sum of 1A + 1B + 1C ingredients is ≥ 5% the mixture must be classified as sub-category 1C. Where at least one relevant ingredient in a mixture is classified as Category 1 without sub-categorization, the mixture must be classified as Category 1 without sub-categorization if the sum of all ingredients corrosive to skin is ≥5%. See redline version		
Appendix A A.3 SERIOUS EYE DAMAGE /EYE IRRITATION **When a substance is classified as Category 2, without further categorization, the classification criteria are the same as those for 2A.** A.3.3.1 **A tiered approach to the evaluation of initial information shall be used where applicable, recognizing that all elements may not be relevant in certain cases (Figure A.3.1).**	This chapter has been updated to align with UN GHS Revision 7. It incorporates the updated tier approach, including the revised schematic. It has extensive updates.	API supports these revisions and notes they are in alignment with UN GHS.

OSHA Proposed Revision/Change	API Comments	API Requests
A.3.3.6 The tiered approach explains how to organize existing information and to make a weight -of -evidence decision about hazard assessment and hazard classification (ideally without conducting new animal tests). Animal testing with corrosive substances should be avoided wherever possible. Although information might be gained from the evaluation of single parameters within a tier, consideration should be given to the totality of existing information and making an overall weight of evidence determination. This is especially true when there is conflict in information available on some parameters. **[a] Existing human or animal data could be derived from single or repeated exposure(s), for example in occupational, consumer, transport, or emergency response scenarios; or from purposely-generated data from animal studies conducted according to validated and internationally accepted test methods. Although human data from accident or poison centere databases can provide evidence for classification, absence of incidents is not itself evidence for no classification as exposures are generally unknown or uncertain;** **[d] Evidence from studies using validated protocols with isolated human/animal tissues or other non-tissue-based, validated protocols should be assessed. Examples of internationally accepted, validated test methods for identifying eye**		

OSHA Proposed Revision/Change	API Comments	API Requests
corrosives and severe irritants (i.e., Serious Eye Damage) include OECD Test Guidelines 437 (Bovine Corneal Opacity and Permeability (BCOP)), 438 (Isolated Chicken Eye (ICE) and 460 (Fluorescein leakage (FL)). Presently there are no validated and internationally accepted in vitro test methods for identifying eye irritation. A positive test result from a validated in vitro test on skin corrosion would lead to the conclusion to classify as causing serious eye damage; **[e] Measurement of pH alone may be adequate, but assessment of acid/alkaline reserve (buffering capacity) would be preferable. Presently, there is no validated and internationally accepted method for assessing this parameter;** **[f] All information that is available on a substance must be considered and an overall determination made on the total weight of evidence. This is especially true when there is conflict in information available on some parameters. The weight of evidence including information on skin irritation may lead to classification for eye irritation. Negative results from applicable validated in vitro tests are considered in the total weight of evidence evaluation.** See redline version		
Appendix B B.2 FLAMMABLE GASES **A pyrophoric gas means a flammable gas that is liable to ignite**	OSHA has updated this chapter to include pyrophoric gas and chemically unstable gas A and B. This is to align with the UN GHS revision	API supports these changes, as they are now in line with the GHS.

OSHA Proposed Revision/Change	API Comments	API Requests
spontaneously in air at a temperature of 54 °C (130 °F) or below. **A chemically unstable gas means a flammable gas that is able to react explosively even in the absence of air or oxygen.** See redline version**.**	7. This changes flammable gas category 1A. In HCS 2012 pyrophoric gas was an OSHA defined hazard. Changes include: - Addition of definitions for "chemically unstable gas" and "pyrophoric gas". - Subdividing Category 1 (extremely flammable gases) into two Subcategories: - Subcategory 1A – includes pyrophoric gases and chemically unstable gases - Subcategory 1B – includes flammable non-pyrophoric gases and chemically stable gases with a lower flammability hazard than 1A. See redline version.	
Appendix B B.3 ~~FLAMMABLE~~ AEROSOLS **Aerosols are classified in one of three categories, depending on their flammable properties and their heat of combustion**. Aerosols shall be considered for classification **in Categories 1 or** 2 **~~as flammable~~** if they **contain more than 1% components (by mass) ~~any component~~** which are classified as flammable in accordance with this Appendix NOTE 2: **~~Flammable~~** Aerosols do not fall additionally within the scope of flammable gases, **gases under pressure**, flammable liquids, or flammable solids**. However, depending on their contents, aerosols**	The *Flammable Aerosols* chapter has been changed to *Aerosols*. Changes Ie: - Name change to "Aerosols" - Addition of Category 3 for non-flammable aerosols - Removal of "flammable aerosol" definition - Addition/deletion of provisions in regards to labelling and classification, products in the Aerosols hazard class do not fall within the scope of the Gases Under Pressure hazard class. See redline version.	Aerosols should be classified in accordance with GHS. While this looks to be in alignment with Rev 7, alignment with Rev 8 would be preferred based on the rationale that alignment with the most recent version of GHS Is most helpful internationally.

OSHA Proposed Revision/Change	API Comments	API Requests
may fall within the scope of other hazard classes. B.3.2.2 An ~~**flammable**~~ aerosol shall be classified in one of the **three** ~~**two**~~ categories for this class in accordance with Table B.3.1. **Category 3 criteria: The chemical does not meet the criteria for Categories 1 and 2. The chemical contains ≤ 1% flammable components (by mass) and has a heat of combustion < 20 kJ/g.** See redline version.		
Appendix B B.6 FLAMMABLE LIQUIDS **[9] To determine the appropriate flammable liquid storage container size and type, the boiling point shall be determined by methods specified under § 1910.106(a)(5) and then listed on the SDS. In addition, the manufacturer, importer, and distributor shall clearly note in sections 7 and 9 of the SDS if an alternate calculation was used for storage purposes.**		Flammable liquids should be classified in accordance with GHS.
Appendix B **CHAPTER B.17 DESENSITIZED EXPLOSIVES** **Desensitized explosives are solid or liquid explosive chemicals which are phlegmatized10 to suppress their explosive properties in such a manner that they do not mass explode and do not burn too rapidly and therefore may be exempted from the hazard class "Explosives" (Chapter B.1; see also Note 2 of paragraph B.1.3).11**	A new hazard class/chapter is being added to align with un GHS revision 7. There are 4 hazard categories in this hazard class. Changes include: Adoption of most of the classification language on desensitized explosives from UN GHS Chapter 2.17 of the GHS Rev. 7 Some selected proposed changes are provided.	Desensitized explosives should be classified in accordance with GHS.

OSHA Proposed Revision/Change	API Comments	API Requests
B.17.1.2 The class of desensitized explosives comprises: **(a) Solid desensitized explosives: explosive substances or mixtures which are wetted with water or alcohols or are diluted with other substances, to form a homogeneous solid mixture to suppress their explosive properties.** **NOTE: This includes desensitization achieved by formation of hydrates of the substances.** **(b) Liquid desensitized explosives: explosive substances or mixtures which are dissolved or suspended in water or other liquid substances, to form a homogeneous liquid mixture to suppress their explosive properties.** **B.17.2.2 Desensitized explosives shall be classified in one of the four categories of this class depending on the corrected burning rate (Ac) using the test "burning rate test (external fire)" described in Part V, sub-section 51.4 of UN ST/SG/AC.10/30/Rev.6 (UN Recommendations of the Transport of Dangerous Goods, Manual of Tests and Criteria) (incorporated by reference; see §1910.6), according to Table B.17.1:** See redline version.	See redline version for all changes. See redline version.	
Appendix C	Proposed Appendix C changes: - Addresses labeling requirements for the new hazard classes and categories in Appendix B: pyrophoric gas, chemically unstable gas A and B, non-flammable aerosols, and	

OSHA Proposed Revision/Change	API Comments	API Requests
	desensitized explosives. See redline version. - Align the HCS labeling with the GHS Rev. 7 - Propose alignment of the HCS and Health Canada's labeling requirements for HNOCs. See below. - Revisions to label elements for OSHA defined hazards. See below. See redline version.	
Appendix C HNOC Figure C.1 – Hazard Symbols and Classes/HNOC **C.2.3.3 The exclamation mark pictogram is permitted (but not required) for HNOCs as long as the words "Hazard Not Otherwise Classified" or the letters "HNOC" appear below the pictogram.**	OSHA is asking if it should be mandatory to require the exclamation mark pictogram to be used for HNOCs. While this aligns with Canada, there has **NOT** been a labeling requirement for HNOCs in the USA.	If not harmonized In GHS, this should not be required.
Appendix C: Precautionary statements • In paragraph C.2.4.10, OSHA is proposing to require prioritization of certain precautionary statements related to medical response. See redline version.	There are many proposed changes to precautionary statements that do not change the meaning but instead align the wording with GHS phrases The burden would be in updating the statements. .	API has no concerns.
Appendix C Label elements for OSHA defined hazards Combustible dust hazard statements May form combustible dust concentrations in air **[if small particles are generated during further**	This proposed HCS combustible dust hazard statement change is consistent with the API litigation settlement. API litigation settlement: May form combustible dust concentrations in air with (a) or (b)	API supports this revision.

OSHA Proposed Revision/Change	API Comments	API Requests
processing, handling or by other means.] **or** **May form explosible dust-air mixture [if small particles are generated during further processing, handling or by other means.]** [2] The chemical manufacturer or importer shall label chemicals that are shipped in dust form, and present a combustible dust hazard in that form when used downstream, under paragraph (f)(1) **of this section**; 2) the chemical manufacturer or importer shipping chemicals that are in a form that is not yet a dust must provide a label to customers under paragraph (f)(4) **of this section** if, under normal conditions of use, the chemicals are processed in a downstream workplace in such a way that they present a combustible dust hazard; and 3) the employer shall follow the workplace labeling requirements under paragraph (f)(6) **of this section** where combustible dust hazards are present. ~~**[if small particles are generated during further processing, handling or by other means.].**~~	a. If converted to small particles during further processing, handling, or by other means, may form combustible dust concentrations in air. b. If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air. This proposed combustible dust hazard statement change is consistent with UN GHS rev 7. UN GHS rev 7: - May form explosible dust-air mixture if dispersed - May form explosible dust-air mixture if small particles are generated during further processing, handling, or by other means	
Appendix D SDS	Appendix D SDS changes include: - Section 3 – Allows for concentration ranges to be withheld as a trade secret. See below. - Section 8 – Clarification that any ingredient or constituent identified in section 3 should have exposure limits	

OSHA Proposed Revision/Change	API Comments	API Requests
	list in Section 8, as applicable. A "range" of exposure limits must be included (i.e. control banding). See below - Section 9 – Proposing to align with GHS Rev. 7 by listing in same order that appears in GHS. See below. - Section 11 – Inclusion of interactive effects and alternative information. See below. - Section 14 – Changes subheading to "Transport in bulk according to IMO instructions"	
Appendix D SDS **While each section of the SDS must contain all of the specified information, preparers of safety data sheets are not required to present the information in any particular order within each section**.	This proposed sentence could be helpful, especially with the new sequence and revised physical and chemical properties in SDS section 9.	API supports this revision.
Appendix D SDS section 1 (d) Name, **U.S.** address, and **U.S.** telephone number of the chemical manufacturer, importer, or other responsible party;	OSHA is codifying the guidance and interpretation that the address and phone number must be in the USA.	API supports this revision.
Appendix D SDS section 2 (a) Classification of the chemical in accordance with paragraph (d) of §1910.1200, **including any hazards associated with a change in the chemical's physical form under normal conditions of use**; **(c) Hazards identified under normal conditions of use that result from a chemical reaction (changing the chemical structure of the original substance or mixture);**	Common examples where this would seem to make sense include reactants mixed in the formation of epoxy resins and the addition of water to cement. However, further examples from OSHA would be helpful. Additionally, Is unclear If the HCS would require chemicals/emissions from downstream use under the General Duty Clause. OSHA is proposing to add the §(d) new hazard classification requirement to SDS section 2. See	API requests greater clarity and more examples. It is unclear, for example, if exhaust hazards would have to be classified for gasoline and diesel. It is also unclear if such exhaust hazards would have to be listed under the General Duty Clause of the HCS. While such information may be provided In Section 11, it now seems that this information must be provided In Section 2. OSHA should ensure that any required hazard classification for changes in physical form or as a

OSHA Proposed Revision/Change	API Comments	API Requests
	(d)(1) above. As proposed, it is all encompassing to include all hazards that result from normal chemical reactions of the product.	result of a chemical reaction will apply only narrowly to conditions of use where it is intended that the chemical will be used in a reaction with water and/or other chemicals.
Appendix D SDS section 3 (d) Impurities and stabilizing additives **(constituents)** which are themselves classified and which contribute to the classification of the substance. (a) The chemical name, **CAS number** or other unique identifier, and concentration (exact percentage) or concentration ranges of all ingredients which are classified as health hazards in accordance with paragraph (d) of §1910.1200 Where a trade secret is claimed in accordance with paragraph (i) of §1910.1200, a statement that the specific chemical identity, exact percentage (concentration), **or concentration range** of composition has been withheld as a trade secret is required. **When the concentration or concentration range is withheld as a trade secret, the chemical composition must be provided in accordance with the prescribed concentration ranges in § 1910.1200(i)(1)(iv).** See (i) trade secret above.	The CAS number or unique identifier is being added as an SDS requirement and concentration ranges are being specified on SDSs.	API has no concerns with this change.
Appendix D SDS section 3	OSHA has expressed interest in having the OSHA HCS SDS section 3 be similar to the EU SDS section 3 where the classification of each	API does not support including physical hazards, along with chemical hazards, on the SDS, as is done in the EU.

OSHA Proposed Revision/Change	API Comments	API Requests
	hazardous component is given in SDS section 3. Although listing the classification of each hazardous ingredient in SDS section 3 is an EU SDS requirement, some stakeholders have stated it is NOT desirable on USA OSHA HCS SDSs. OSHA is also asking if physical hazards and HNOCs should be included in SDS section 3. In several public venues OSHA has stated that they believe these are helpful provisions for downstream users.	
Appendix D SDS section 7	For flammable liquids, the chemical manufacturer, importer, or distributor must clearly note on the SDS (in sections 7 and 9) if a calculation other than initial boiling point was used for storage purposes.	
Appendix D SDS section 8 (a**) For all ingredients or constituents listed in Section 3,** the OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit **or range** used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available	This proposed revision incorporates OSHA HCS interpretations.	API supports this revision.
Appendix D SDS section 9 (**a) Physical state** **(b) Color**	This proposed revision aligns with UN GHS revision 7. There are new proposed physical and chemical	API requests further clarification from OHSA on If the sequence of physical/chemical properties must

OSHA Proposed Revision/Change	API Comments	API Requests
(c) Odor **(d) Melting point/freezing point** **(e) Boiling point (or initial boiling point or boiling range)** **(f) Flammability** **(g) Lower and upper explosion limit/flammability limit** **(h) Flash point** **(i) Auto-ignition temperature** **(j) Decomposition temperature** **(k) pH** **(l) Kinematic viscosity** **(m) Solubility** **(n) Partition coefficient n-octanol/water (log value)** **(o) Vapor pressure** **(p) Density and/or relative density** **(q) Relative vapor density** **(r) Particle characteristics**	properties. The sequence of the physical and chemical properties has been changed.	be ordered as specified in the language of the rule at left.
Appendix D SDS section 10 (c) Possibility of hazardous reactions, **including those associated with foreseeable emergencies**;	API has no comment.	API has no comment.
Appendix D SDS section 11 **(e) Interactive effects; information on interactions should be included if relevant and readily available;** **(g) When specific chemical data or information is not available, the preparer must indicate if alternative information is used and the method used to derive the information (e.g., where the preparer is using information from a class of chemicals rather than the exact chemical in question and using SAR to derive the toxicological information)**	API has no comment.	API has no comment.
GHS REVISION 8		

OSHA Proposed Revision/Change	API Comments	API Requests
OSHA invites public comments on whether OSHA should consider adopting GHS Rev 8 Appendix A (based on the GHS Rev 8)	GHS Rev 8 expanded the use of non-animal test methods in UN GHS Chapter 3.2 (skin corrosion/irritation). These changes include recognition of specific in vitro test methods. The proposed inclusion of Rev 8 elements might be viewed as beneficial, especially to manufacturers utilizing in vitro data.	API requests that OSHA provide the exact language for public comment before stakeholders are requested to provide an opinion.
OSHA invites public comments on whether OSHA should consider adopting GHS Rev 8 Appendix B (based on the GHS Rev. 8)	GHS Rev. 8 contains several significant additional changes in the aerosol chapter. • GHS Rev. 8 lists classification criteria for aerosols as text in a table. This is a potentially useful update. • In Rev. 8, GHS adopted a new hazard category within the aerosols class: chemicals under pressure. These products function similarly to aerosol dispensers (UN 1950), but are packed in pressure receptacles.	API requests that OSHA provide the exact language for public comment before stakeholders are requested to provide an opinion.
OSHA invites public comments on whether OSHA should consider adopting GHS Rev 8 Appendix C (based on the GHS Rev 8)	Appendix C (based on the GHS Rev 8) GHS Rev. 8 includes additional revisions to precautionary statements, most notably an overhaul of the medical response precautionary statements. Perhaps asking for greater flexibility is an approach for precautionary statements.	API requests that OSHA provide the exact language for public comment before stakeholders are requested to provide an opinion.

OSHA Proposed Revision/Change	API Comments	API Requests
OSHA questions/input OSHA is asking for comments about a schedule for updating the OSHA HCS. This is an important industry issue. OSHA is asking for comments about HCS guidance. OSHA is asking for comments about the implementation phase-in.	OSHA invites comments on various costs, hours involved, etc. In the past, industry has had difficulty developing these estimated numbers.	API requests that solicitation from stakeholders for the HCS revision schedule take place in a forum separate from the update of the HCS. API notes the need to strike a workable balance between ensuring the consistency of the HCS with recent versions of the GHS, the normal cycle of change, and an update of the HCS that is not overly frequent.

References

OSHA HCS Federal Register Notice
https://www.federalregister.gov/documents/2021/02/16/2020-28987/hazard-communication-standard

OSHA HCS red-line strikeout of the regulatory text and affected appendices
https://www.osha.gov/sites/default/files/HCS_NPRM_RegText_Appendices_redline_OSH_01282021.pdf

Key changes to the HCS – OSHA slides
https://www.osha.gov/sites/default/files/HCS%20Update_January%202021.pdf

In Summary, API is pleased to provide comments and suggestions to the HCS. If OSHA has any questions or concerns, please feel free to contact me.

Sincerely,

Jessica Ryman-Rasmussen, PhD., DABT