



BEST PRACTICE: Metal Trade Associations Creating a Metal Alloy HPD

Version: 2023-11-06

BACKGROUND OF METAL ALLOY SPECIAL CONDITION

Definitions

Metal alloy: A metal alloy is a material made by combining metals and/or other elements. The alloying process modifies the properties of the material, usually providing increased strength, malleability, or resistance to corrosion.

Individual alloying elements: Individual substances that are combined to form a metal alloy, e.g., zinc, copper, manganese, lead, etc.

Summary of the Metal Alloy Special Condition Policy

Use of the Metal Alloy Special Condition policy allows a manufacturer to report metal alloy content in a tandem process:

1. Metal alloys in a product or part can be reported directly on a Product HPD.
2. The HPD reporting the metal alloy should refer to a separate HPD to provide detailed metal alloy composition data, and hazard screening data for individual alloying elements.

Manufacturers may also choose to omit this tandem reporting process and report the full metal alloy composition data and hazard screening data on the Product HPD.

Effective with this policy, the use of CAS RNs referring to metal alloys, e.g., 12597-68-1: Stainless Steel, is disallowed in all cases on HPDs.

Scope of the Metal Alloy Special Condition

This Special Condition addresses only the bare, uncoated, untreated metal alloys used in a product or part. Metal coatings and treatments on those products or parts are considered distinct content and are to be inventoried separately in the HPD.

Required for All HPDs with Metal Alloys

All Product HPDs reporting metal alloy content are required to comply with this policy to be considered complete, published HPDs. HPDs not following this policy that are published after the effective date, must be removed from publication and revised.



Compliance with the HPDC Metal Alloy Special Condition Policy

There are two options for compliance within the HPDC Metal Alloy Special Condition. For the purposes of this document and for Trade Associations created a Metal Alloy HPD, Option 2 will be followed.

Option 1. Metal Alloy Option

This option is available to any Product HPDs reporting metal alloys as content. Detailing this option is the main purpose of this Special Condition policy. This option is for an HPD whose main purpose is to report on the elemental contents of a metal alloy.

To report metal alloy content and associated potential hazards, follow the reporting guidelines detailed in this document (under “Explanation of Policy” and “Instructions” below).

Option 2. Alloying Element Option

This option is available for Product HPDs to report on the elemental composition of a metal alloy.

Under this option, manufacturers are treating the individual alloying elements as the ingredients in their finished product, and should report those ingredients with their specific CAS RN, e.g. 7429-90-5: Aluminum, 7440-66-6: Zinc, 7440-50-8: Copper, etc. Follow the typical HPD Open Standard instructions and provide inventory and hazard screening information for all intentionally added substances and residuals/impurities, i.e., the individual alloying elements, above the chosen reporting threshold. The inventory should be complete, thorough, and verifiable; for this purpose, reference to UNS or CEN classification systems (see below) is required in the Substance Notes. *There is no further guidance on this option in this policy.*

WHY COLLABORATION BETWEEN HPDC AND METAL TRADE ASSOCIATIONS IS IMPORTANT

HPDC is looking to Metal Trade Associations to assist manufacturers by providing product HPD’s for applicable metal alloying elements. The goal of this collaboration is to:

1. Provide a more accurate content inventory.
2. Provide a more accurate hazard assessment of the metal alloy.
3. Utilize the availability of industry-specific inventory and classification systems.
 - a. A significant contributor to the development of this policy is the availability of industry-specific classification and inventory systems that are broadly adopted within the metal alloys supply chain and that support transparency.
 - b. The typical CAS RN numbering system used in the HPD often fails to provide detailed content inventory information when used for metal alloys. CAS RNs are often available for metal alloys, but they typically lack specificity. For example, #12597-68-1 is the main CAS RN used on HPDs for Stainless Steel. This CAS RN encompasses all of the hundreds of varieties of stainless steel without differentiation for content differences across different stainless steel alloys.
 - c. An alternative numbering system, the Unified Numbering System (UNS), is widely accepted in North America as a system designating alloy composition.



- UNS is managed jointly by the ASTM International and SAE International. UNS codes consist of a prefix letter and five digits designating a material composition. For example, a prefix of S indicates stainless steel alloys (UNS S13800 and UNS S20153, for example), and C indicates copper, brass, or bronze alloys. A UNS code provides a transparent and detailed content inventory of a metal alloy.
- d. There are other alloy numbering systems, including CEN, used in Europe. These systems define alloy composition similar to UNS, and some trade associations¹ provide tools to align different systems.

EXPLANATION OF BEST PRACTICE

Special Condition: Reporting Metal Alloy on a Product HPD or Supplier HPD

A metal trade association completing a Product HPD or Supplier HPD shall provide in the content inventory information about the specific metal alloy used in the product, using UNS or CEN classification systems, and its alloying elements.

The Product HPD or Supplier HPD provides full inventory and hazard screening information of the alloy following typical HPD instructions. The Supplier HPD or Product HPD must refer to the requirements under Option 2 above (see “Compliance with Policy”) to report individual alloying elements per the CAS RN of those elements, and not using CAS RNs for metal alloys.

Third-Party Verification to Support “Authoritative” Metal Alloy HPDs

The same metal alloys are used by many product manufacturers. Rather than each manufacturer repeating the same work to report a metal alloy, this policy is intended to support the production and use of “authoritative” Product HPDs or Supplier HPDs for alloys. For example, a single authoritative Product HPD could be produced for Stainless Steel UNS S13800 and referenced by any manufacturer using that alloy.

HPDC encourages trade associations representing metal alloy manufacturers to create these authoritative Product HPDs, though any manufacturer or group of manufacturers can do so. HPDC strongly encourages [third-party verification](#) of these Product HPDs by checking the Product HPD against UNS (or similar) composition information. To be referenced by an HPD that seeks to be third-party verified, the Product HPD or Supplier HPD for the metal alloy must also be third-party verified.



INSTRUCTIONS

Instructions for specific data fields follow.

*Data field auto-fills if using HPD Online Builder

HPD Data Field	Special Condition Requirements
SECTION 1: SUMMARY	
MasterFormat Classification	<ul style="list-style-type: none"> ● Select N/A and add the following to the “N/A MasterFormat Notes” <i>“MasterFormat is selected as not applicable because this product HPD is for a metal alloy created by a metal trade association that is further fabricated into different product end-use applications. This notation is in collaboration with HPDC's Hazards Technical Subgroups to support the Metal Alloy Special Condition.”</i>
Threshold Disclosed Per:	<ul style="list-style-type: none"> ● “Product – Other” should be selected for a Metal Trade Association creating a Metal Alloy HPD. <ul style="list-style-type: none"> ○ Note: This is because UNS and EN systems correlate different classification systems used by global trade associations and are not a specification. ○ UNS and EN are composition-based systems of commercial materials that do not articulate a reporting threshold but are the best available options to associate individual systems and is supported by major trade associations.
Content in Descending Order of Quantity*	No changes to requirements for this Best Practice.
Characterized Screened Identified*	No changes to requirements for this Best Practice.



Inventory and Screening Notes*	<ul style="list-style-type: none"> ● Identify any publicly available resources for metal alloy compositions. ● Encourage users to obtain specific compositions from alloy suppliers. ● Describe the process of how specific trade association designations (e.g., AISI/SAE numbers for steel alloys) relate to or were assigned to the UNS or EN number.
SECTION 2: CONTENT IN DESCENDING ORDER OF QUANTITY	
Nested Materials – instructions apply only to Nested Materials Inventory format	
Material Name (top level in Nested inventory)	Name the Nested Material in which the alloy is the content. For example, enter “Aluminum Extrusion.” Within this Nested Material, nest the specific aluminum alloy that was used (see below for this procedure), along with any additional ingredients such as coatings that are part of that Nested Material (using the typical HPD instructions). If the alloy is the only content in this Nested Material, simply follow the procedure below to list the alloy content.
Residuals and Impurities Notes	<p>Instructions are applicable if marking “Yes” for a completed evaluation of residuals and impurities for this Material or Product.</p> <ul style="list-style-type: none"> ● Enter “Defined by UNS” if you are reporting a material with a UNS designation, or “Defined by CEN,” etc., depending on the classification system you are using. ● Add “HPD users may obtain a Supplier Certificate of Analysis for specific alloy composition and concentration of alloying elements. HPD authors with a Certificate of Analysis should enter a functional URL to that certificate, e.g., a link posted on your website.”
Other Product Notes	<p>Add statement from Metal Alloys Special Condition:</p> <p>"Metal alloys have different intrinsic characteristics than the metals encapsulated therein. This is due in part to the impact of the alloying process on microstructural features including grain size, inclusions, impurities, second phases, porosity, and segregation, which in turn influences physical properties and surface phenomena.</p> <p>Similarly, alloys are generally expected to have different hazards than their alloying elements. These differences are driven by the following factors: the elemental composition of the alloy as a metal mixture; the speciation of metals contained within the alloy; and the solubility of, or release of metal ions from, the surface of the alloy... Hazard assessment of metals is unique, in that it evaluates data typically associated with exposure, i.e., information on solubility, bioaccessibility, and bioavailability, in combination with toxicological data to</p>



	characterize the intrinsic toxicity of metallic substances. This approach recognizes that the metal ion is the toxic moiety responsible for effects observed in vivo, and the metal ion’s oxidation state and biological interaction determine the toxicity.”
<p>Content – instructions apply to both Nested Materials and Basic Inventory formats.</p> <p>See the mockup after this chart to see what an accurate content inventory looks like.</p>	
Substance Name	Enter the alloying elements and the associated CASRNs that comprise the alloy being reported.
ID (Identifier):	No changes to requirements for this Best Practice.
Hazard Data Source	No changes to requirements for this Best Practice.
GreenScreen*	No changes to requirements for this Best Practice.
Recycled Content	Select “UNK (Unknown)”. Alloys may contain recycled content, but type and source are not identified or associated with a UNS or CEN alloy composition. HPD authors must follow all Recycled Content requirements as defined in the HPD v2.3 Standard, as well as the Mixed Recycled Content Special Condition if applicable.
Substance Role	Select “Alloying Element” or “Impurity/Residual” as applicable.
Hazards and Agency(ies) with Warnings*	No changes to the requirements for this Best Practice.
Material Notes	“Recycled content type and source is dependent on the alloy manufacturer/provider.”
SECTION 3: CERTIFICATIONS AND COMPLIANCE	



No changes to the requirements for this Best Practice.

SECTION 4: ACCESSORIES

No changes to the requirements for this Best Practice.

SECTION 5: GENERAL NOTES

Add all “synonyms” or cross-references of trade association designations, and add all associated standards and specifications, if applicable.

SECTION 6: REFERENCES

No changes to the requirements for this Best Practice.