HS CODES FOR HFCs

ADVICE FOR COUNTRIES IN ADVANCE OF THE 2022 HS CODE UPDATE

OZONACTION POLICY BRIEF

The Kigali Amendment

The Parties to the *Montreal Protocol on Substances that Deplete the Ozone Layer* reached agreement at their 28th Meeting of the Parties in October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs). One of the important requirements of this Amendment is that by 1st January 2019[1] (or two years later if required - see below) an import and export licencing system for HFCs needs to be in place in each country that is Party to the Amendment. This applies to both Article 5 and non-Article 5 countries. To enable a licencing system to function effectively it is important that the government is able to monitor and record imports and exports of each specific HFC individually. Import and export statistics are normally collected by customs officers using the international product nomenclature system - The Harmonized Commodity Description and Coding System, or Harmonized System (HS). However, until the HS is revised in 2022, all HFCs are contained in a single HS code which does not allow differentiation of the individual chemicals or of mixtures (also referred to as 'blends').[2] **This document outlines a proactive interim approach, recommended by the World Customs Organization (WCO), to establish additional digits in the existing national HS codes to identify specific HFCs.**

HS Codes

The Harmonized System is a multipurpose international product nomenclature developed by the WCO. It forms the basis for Customs tariffs and for the collection of international trade statistics, with each commodity group identified by a six-digit code arranged in a legal and logical structure. Over 98% of merchandise in international trade is classified in terms of the HS. WCO issues Amendments every five to six years to update the HS.[3]

Implementing import and export licencing systems for HFCs from 1st January 2019 may present a challenge for countries, as the most recent HS Nomenclature 2017 edition did not include individual codes for HFCs and the next HS edition which will include specific HS codes for the most commonly traded HFCs and mixtures, will only enter into force in 2022. Prior to the official entry into force and for those countries that do not promptly adopt the 2022 HS Amendments (after their entry into force), it is important for governments, particularly customs and enforcement officers, to be able to identify, monitor and control imports and exports of HFCs. It will not be possible, based on customs data that relies *only* on existing HS codes, for customs to differentiate between imported/exported HFCs and other fluorinated, brominated or iodinated substances. A special approach is therefore needed.

Current HS codes for HFCs

All HFCs are covered by the single HS code: **2903.39**

Mixtures containing HFCs are currently covered by the following HS code: **3824.78**

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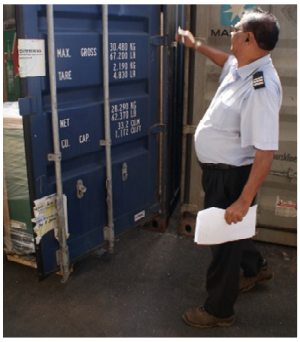


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Taking a proactive approach

Since the Kigali Amendment has entered into force and each country that is Party to the Amendment is required to have an import and export licencing system for HFCs in place, the creation of specific individual national HS codes for HFCs is therefore very much needed. In advance of the release of the new version of the HS, there are actions which countries can take in the interim. The suggested approach is to establish additional digits in the national (domestic) HS codes to identify specific HFCs. Details and examples are provided below.

The national system will need to be adjusted when the 2022 HS is implemented; the additional national codes will need to be removed from the time that HS 2022 is implemented.

Can the 2022 HS codes for HFCs be used in advance of their official entry into force?

No! The provisionally adopted codes are prohibited from being used ahead of their official entry into force. The WCO has strict rules about contracting parties adopting/using amendments prior to their scheduled publication date. Before their official entry into force the codes are not considered to be legal or to be enforceable.

The International Convention on the Harmonized Commodity Description and Coding System is a legally binding Convention, and the Obligations of Contracting Parties (Article 3, 1(a)) include an obligation that prevents the change of headings and subheadings in force. HS 2017 (or earlier versions if countries are still using these) remains in force until superseded by a Contracting Party's implementation of HS 2022 as the accepted amendment. So while HS 2017 is in force, it must be used ***as is*** at the heading and international subheading level, with no possibility of using the new codes for HFCs in advance of the official release of the 2022 HS.

The Convention does however allow for further national subdivisions below the six digit level (i.e. adding additional digits at the national level under the existing headings and subheadings). This is the recommended course of action countries should take in the interim, as explained below.

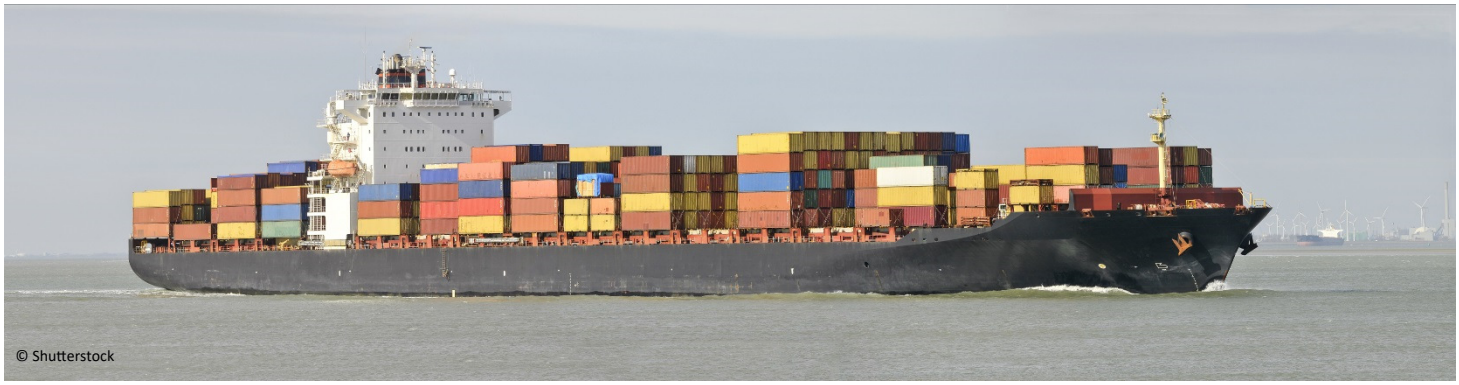
The Way Forward: WCO Recommendation that HS contracting Parties establish additional digits in the current national HS to identify specific HFCs

To facilitate a country's monitoring and control over imports and exports using the Harmonized System, it has the option to add additional subdivisions, at the national level, under the six-digit HS code.

Paragraph 3 of Article 3 of *The International Convention on the Harmonized Commodity Description and Coding System* allows for further national subdivisions below the six digit level. It is thus recommended that countries use national subdivisions at the seven or more digit levels under the existing headings and subheadings to account for specific HFC and HFC-containing mixtures under HS 2017. In cases where a regional approach is adopted, it may be necessary, at the national level, to also extend the national subdivisions to 7 or more digits.

Therefore as an interim measure, the WCO approved at its Council Session in June 2019, a new Recommendation that HS Contracting Parties insert the relevant new additional subheadings in their statistical nomenclatures.[4]

Countries are therefore recommended to expeditiously insert additional subdivisions for the HFCs and HFC-containing mixtures provided below in their HS. Examples of regional and national implementation of these subdivisions are given overleaf.



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Differentiation of specific HFCs in the 2017 HS

The WCO recommends that countries (member administrations and Contracting Parties to the HS convention) insert additional subdivisions ***as soon as possible*** for the following substances to facilitate the collection and comparison of data on the international movement of HFCs and HFC-containing mixtures controlled under the Montreal Protocol by virtue of the Kigali Amendment (see page 11 for table of chemical names and abbreviations).

The information herein is intended to provide an overview and examples. For complete information please refer to the original WCO documentation (see footnote 4).

Pure substances

Under subheading **2903.39** *(Halogenated derivatives of hydrocarbons, Other)*

Saturated fluorinated derivatives of acyclic hydrocarbons (HFCs)

- HFC-23
- HFC-32
- HFC-41, HFC-152, HFC-152a
- HFC-125, HFC-143a, HFC-143,
- HFC-134a, HFC-134
- HFC-227ea, HFC-236cb, HFC-236ea, HFC-236fa
- HFC-245fa, HFC-245ca
- HFC-365mfc, HFC-43-10mee

Unsaturated fluorinated derivatives of acyclic hydrocarbons (HFOs)[5]

- HFO-1234yf, HFO-1234ze(E), HFO-1336mzz(Z)

Mixtures

Under subheading **3824.74** *(Mixtures containing **HCFCs**, whether or not containing perfluorocarbons* or HFCs, but not containing CFCs)*

- Containing saturated fluorinated derivative of methanes, ethanes and propanes, HFC-365mfc, HFC-43-10mee
- Other, containing substances of subheadings 2903.71 to 2903.75

Under subheading **3824.78** (*Mixtures Containing Perfluorocarbons* or Hydrofluorocarbons, but **not** CFCs or HCFCs)*

Containing trifluoromethane (HFC-23) or perfluorocarbons (PFCs) but not containing chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs)

- Mixture containing *HFC-23*
- Other

Containing other hydrofluorocarbons (HFCs) but not containing chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs)

- Mixture containing 15% or more by mass of HFC-143a
- Others, not included in the subheading above, containing 55% or more by mass of HFC- 125 but ***not*** containing HFOs
- Others, not included in the subheadings above, containing 40% or more by mass of HFC-125
- Others, not included in the subheadings above, containing 30% or more by mass of HFC-134a, but **not** containing HFOs
- Others, not included in the subheadings above, containing 20 % or more by mass of HFC-32 **and** 20% or more by mass of HFC-125
- Others, not included in the subheadings above, containing *saturated fluorinated derivative of methanes, ethanes and propanes* , HFC-365mfc, HFC-43-10mee

* PFC = not controlled under the Montreal Protocol

Examples of establishing additional digits in the national HS codes to identify specific HFCs

As mentioned above, a country has the option, at the national level, to extend the six-digit HS code for any commodity up to 7 or more digits . This can be done at the regional level, for example, for the most commonly traded HFCs and mixtures the European Union (EU) added an additional two digits to create an eight-digit customs classification ("*Combined Nomenclature*").

Similarly, at the national level, Colombia, for example, has extended the HS to an eight-digit national customs classification of HFCs and HFC-containing mixtures. These two examples are similar in approach and both allow for differentiation between the most common HFCs and refrigerant mixtures, however they differ in some detail. For example, the Colombian classification includes several more codes for individual HFCs, and commonly traded hydrofluoroolefins (HFOs) are not included.[5] The additional digits adopted for each specific HFC or mixture are not the same in most cases between these two systems.

The tables below and at right illustrate some example HFCs and HFC-containing mixtures and the codes assigned to them by the EU and Colombia respectively (see page 11 for a table of chemical names and abbreviations used).

HS code extension digits for individual HFCs - examples *(additional digits in bold)*

ASHRAE Designation/description	European Union	Colombia
Saturated fluorides		
HFC-32	2903.39 **21**	2903.39 **14**
HFC-23	2903.39 **23**	2903.39 **12**
HFC-14	-	2903.39 **13**
HFC-125	-	2903.39 **23**
HFC-143a	-	2903.39 **25**
HFC-125 and HFC-143a	2903.39 **24**	-
HFC-152a	2903.39 **25**	2903.39 **21**
HFC-134a	2903.39 **26**	2903.39 **22**
HFC-236fa	-	2903.39 **31**
HFC-227ea	-	2903.39 **33**
Pentafluoropropanes, Hexafluoropropanes and Heptafluoropropanes (includes HFC-227ea, 236cb, 236ea, 236fa, 245ca, 245fa)	2903.39 **27**	-
All other saturated HFCs and PFCs*	2903.39 **29**	2903.39 **99**[6]
Unsaturated HFCs (HFOs)		
HFC-1234yf	2903.39 **31**	-
HFC-1234ze(E)	2903.39 **35**	-
Other unsaturated fluorides- All other unsaturated HFCs (HFOs) and all unsaturated PFCs (PFOs)	2903 39 **39**	-

This table is not intended to be comprehensive, rather to provide examples.

* PFC = Perfluorinated compound (not controlled under the Montreal Protocol)

HS code extension digits for HFC containing mixtures - examples

(additional digits in bold)

ASHRAE Designation/ description	Substances, *(percentage composition)**	European Union	Colombia
Mixtures			
R-507	Mixture of HFC-125 and HFC-143a *(50%, 50%)*	-	3824.78 **70**
R-507 series	Mixture of HFC-125 and HFC-143a	3824.78 **10**	-
R-404A	Mixture of HFC-125, HFC-143a and HFC-134a *(44%, 52%, 4%)*	-	3824.78 **10**
R-404 series	Mixture of HFC-125, HFC-143a and HFC-134a	3924.78 **20**	-
R-410A	Mixture of HFC-125, HFC-32 *(50%, 50%)*	-	3824.78 **40**
R-410 series	Mixture of HFC-125 and HFC-32	3824.78 **30**	-
R-407A	Mixture of HFC-125, HFC-32 and HFC-134a *(40%, 20%, 40%)*	-	3924.78 **20**
R-407C	Mixture of HFC-125, HFC-32 and HFC-134a *(25%, 23%, 52%)*	-	3824.78 **30**
R-407 series	Mixture of HFC-125 , HFC-32 and HFC-134a	3824.78 **40**	-
R-417A	Mixture of HFC-125, HFC-134a and HC-600 *(46.6%, 50%, 3.4%)*	-	3824.78 **50**
R-422D	Mixture of HFC-125, HFC-134a and HC-600a *(65.1%, 31.5%, 3.4%)*	-	3824.78 **60**
All mixtures containing unsaturated HFCs (HFOs)	Containing unsaturated hydrofluorocarbons	3824.78 **80**	-

This table is not intended to be comprehensive, rather to provide examples.

* Colombia - The quantities of each component (percentage composition by mass) are specified for each mixture e.g.

R-407A: HFC-125 (40%), HFC-32 (20%) and HFC-134a (40%) **R-407C:** HFC-125 (25%), HFC-32 (23%) and HFC-134a (52%)

The requirement for data reporting

Compliance with the Montreal Protocol depends on timely and accurate reporting of production and consumption data. Given that in the Montreal Protocol context '*consumption*' is calculated from data on **imports** and **exports** as well as production and destruction, the requirement for trade data on all controlled substances is essential to enable calculation of consumption of these substances. Since the countries need to report data separately on specific substances, customs officers must have a means to differentiate between the most common HFCs and refrigerant mixtures using the HS. Until the 2022 update to the HS is available, it is recommended to implement a suitable system such as that outlined in this document. OzonAction and its regional teams stand ready to assist as required.

Date of licencing system implementation

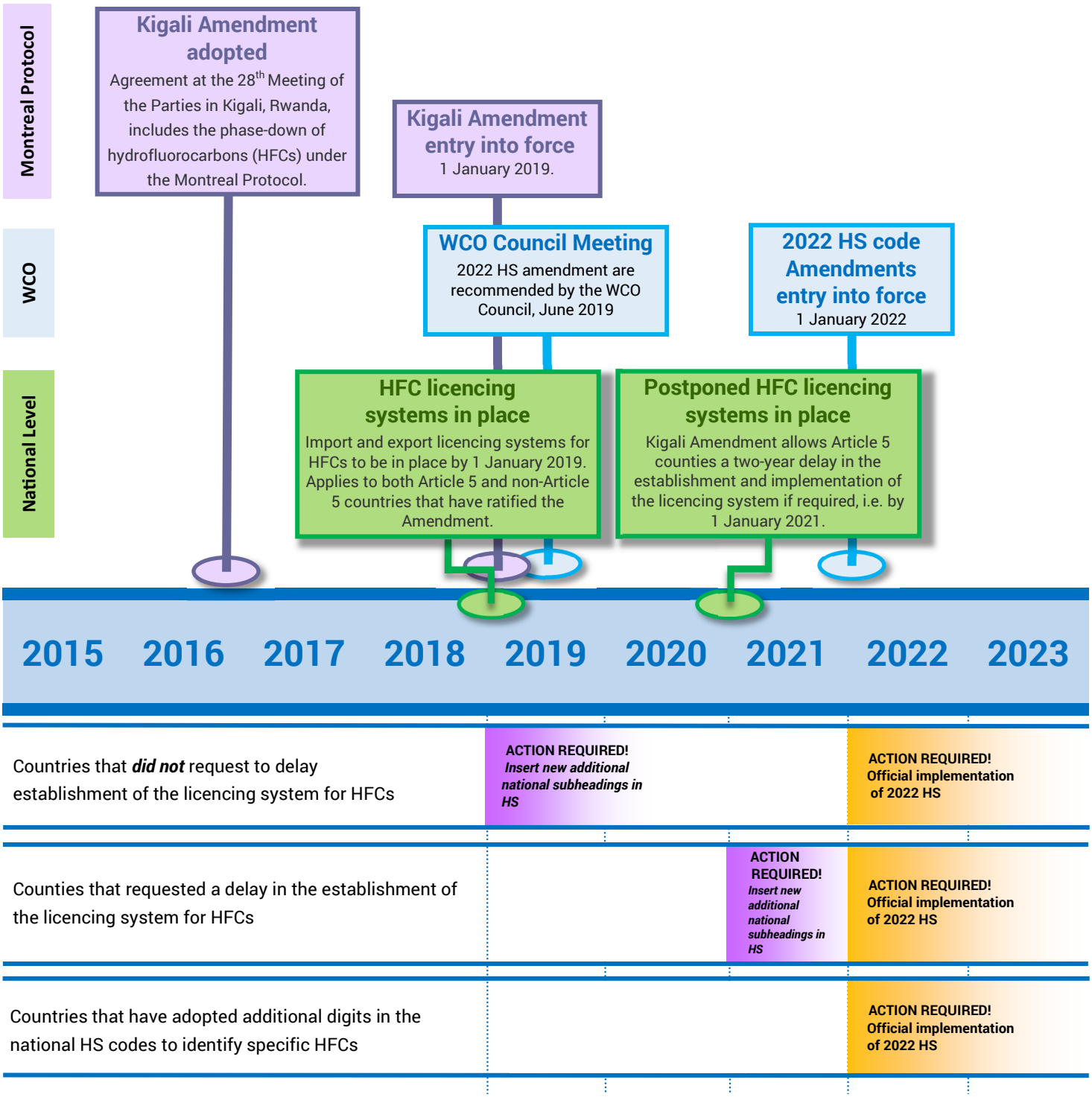
While the date for HFC licencing systems to be in place was 1st January 2019 for Parties to the Kigali Amendment, the text of the Amendment allows Article 5 countries a two-year delay in the establishment of the licencing system if required: "*Any Party operating under paragraph 1 of Article 5 that decides it is not in a position to establish and implement such a system by 1 January 2019 may delay taking those actions until 1 January 2021*."

It is recommended that if any country which is Party to the Kigali Amendment decides it is not yet in a position to implement the licencing system for HFCs, the government should formally notify the Ozone Secretariat as soon as possible. OzonAction can provide assistance as required.

While this provision may give some additional time to countries to establish the licencing system, it does not solve the problem of the availability of specific HS codes as the official release of the next version of the HS is 2022, a full year after the extension period. It is therefore recommended that countries take proactive and early actions to enable them to effectively monitor and control the import and export of HFCs.

Timeline

There will be a period between the dates of 1 January 2019, when import and export licencing systems for HFCs under the Kigali Amendment are due to be in place for countries Party to the Amendment (or 1 January 2021 for those Article 5 countries that decide to delay establishment and implementation) and the time of adoption of the 2022 HS at the national level where countries may need to take a proactive approach (see 'Action required' in the illustration below). Unless a country has already made arrangements to address this, it will not be able to easily monitor, control and report data on imports and exports of specific HFCs and HFC-containing mixtures. The 2022 HS enters into force on 1 January 2022, but it can take some time for countries to adopt the Amended HS, which will extend the period where countries may need to use the suitable interim approach such as outlined in this document.



The 2022 HS codes for HFCs

For Information Only: These codes are not effective until 2022 and cannot be used ahead of their entry into force

To ensure uniform interpretation of the HS and its regular updating in response to developments in technology and changes in trade patterns, the WCO prioritises the maintenance of the HS. The WCO manages this process through the Harmonized System Committee which, *inter alia*, prepares amendments updating the HS every five to six years[3].

In terms of advances resulting from the Kigali Amendment and controls required in the near future for HFCs, the HS Committee has approved a proposal to update the HS to create HS codes for commonly traded HFCs.[7] This also includes HS codes for HFCs contained in mixtures.

This proposal was adopted by the Council Session in June 2019 .[8]

The tables below and at right provide the specific new HS codes that will be included in the 2022 HS. For mixtures containing HFCs, some example refrigerant mixtures have been included in the table, indicating how they are classified by the specific HS codes. The tables are not intended to be comprehensive, rather to provide an overview and examples. For complete information please refer to the original documentation. See page 11 for a table of chemical names and abbreviations.

This information is provided to explain the amendments which will be included in the 2022 HS and to assist countries to understand and prepare for the implementation of the codes in 2022. It is not intended to encourage or endorse their advance use prior to entry into force - this is prohibited under the obligations of the HS Convention.

HS codes for individual HFCs

2022 HS Code	Substance
2903.4	Saturated fluorinated derivatives of acyclic hydrocarbons
2903.41	HFC-23
2903.42	HFC-32
2903.43	HFC-41, HFC-152, and HFC-152a
2903.44	HFC-125, HFC-143a and HFC-143
2903.45	HFC-134a and HFC-134
2903.46	HFC-227ea, HFC-236cb, HFC-236ea and HFC-236fa
2903.47	HFC-245fa and HFC-245ca
2903.48	HFC-365mfc and HFC-43-10mee
2903.49	Other
2903.5	Unsaturated fluorinated derivatives of acyclic hydrocarbons (HFOs)
2903.51	HFO-1234yf, HFO- 1234ze(E) and HFO-1336mzz(Z)
2903.59	Other

HS codes for mixtures containing HFCs

2022 HS Code	Substances	Examples
Containing trifluoromethane (HFC-23) or perfluorocarbons (PFCs) but not containing chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs)		
3827.51	Mixtures containing HFC-23	R-508A R-508B
3827.59	Other *(i.e. containing PFCs, but **not** HFC-23, CFCs or HCFCs)*	R-413A
Containing other hydrofluorocarbons (HFCs) but not containing chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs)		
3827.61	Containing 15% or more by mass of HFC-143a (1,1,1-trifluoroethane)	**R-404A** R-428A R-434A **R-507A**
3827.62	Others, not included in the subheading above, containing 55% or more by mass of HFC- 125 (pentafluoroethane) but ***not*** containing unsaturated fluorinated derivatives of acyclic hydrocarbons (HFOs)	R-407B R-421A R-422C R-410B R-421B R-422D R-417B **R-422A** R-422E R-419A R-422B
3827.63	Others, not included in the subheadings above, containing 40% or more by mass of HFC-125 (pentafluoroethane)	**R-407A** R-424A R-452C **R-410A** R-438A R-460A R-417A R-439A R-419B **R-452A**
3827.64	Others, not included in the subheadings above, containing 30% or more by mass of HFC-134a (1,1,1,2 tetrafluoroethane) but ***not*** containing HFOs (unsaturated fluorinated derivatives of acyclic hydrocarbons)	**R-407C** R-407H R-427A R-407D R-417C R-437A R-407E R-423A R-442A **R-407F** R-425A R-453A R-407G R-426A R-458A
3827.65	Others, not included in the subheadings above, containing 20 % or more by mass of HFC-32 (difluoromethane) **and** 20% or more by mass of HFC-125 (pentafluoroethane)	**R-448A** R-449C **R-449A** R-460B **R-449B**
3827.68	Others, not included in the subheadings above, containing substances of subheadings 2903.41 to 2903.48 (i.e. containing HFC-23, HFC-32, HFC-41, HFC-152, HFC-152a, HFC-125, HFC-143a, HFC-143, HFC-134a and HFC-134, HFC-227ea, HFC-236cb, HFC-236ea, HFC-236fa, HFC-245fa, HFC-245ca, HFC-365mfc and/or HFC-43-10mee)	R-429A R-447A R-455A R-430A R-447B R-456A R-431A R-450A R-457A R-435A R-451A R-459A R-440A R-451B R-459B R-444A R-452B R-512A R-444B R-454A R-513A R-445A R-454B R-513B R-446A R-454C R-515A
3827.69	Other (i.e. containing other HFCs not listed in subheadings 3827.61 to 3827.68 - can *also* contain HFOs)	**R-514A**

Commonly used/traded mixtures (or expected to be commonly traded) are indicated in **bold**.

Conclusions

The Kigali Amendment has entered into force and each country that is Party to the Amendment is required have in place an import and export licencing system for HFCs. To enable countries to effectively monitor, control and report data on imports and exports of specific HFCs and HFC-containing mixtures, the creation of specific individual HS codes for HFCs at the national level is therefore very much required.

The 2022 HS, which will include specific codes for HFCs and HFC-containing mixtures will officially enter into force on 1 January 2022. In advance of this release, there are actions which countries can take in the interim.

The suggested approach, recommended by the WCO, is to establish additional digits in the national HS codes to identify specific HFCs. These codes can be used in the interim until the country adopts the 2022 HS. This publication has provided an overview of the additional subdivisions that are recommended to be adopted and provided some examples of how this has been implemented. It is important to note that the adopted codes for the 2022 HS (indicated on pp. 8-9) are prohibited from being used ahead of their official entry into force.

The national system will then need to be adjusted when the 2022 HS enters into force. In countries where this takes some time, the 2017 HS (or previous version) can continue to be used with the additional subheadings.

UN Environment OzonAction can provide assistance as required to National Ozone officers and other stakeholders.

Establishing additional digits in the national HS codes to identify specific HFCs

- ✓ The most feasible and practical interim option
- ✓ This is the approach recommended by the WCO
- ✓ Specifics can be adjusted to suit a country's particular needs
- ✓ Many countries have already successfully adopted this approach
- ✓ A streamlined regional approach could be considered

- × It is a temporary approach
- × The additional digits in the national HS codes will need to be removed from the time that HS 2022 is implemented
- × The additional codes can vary between countries/ regions for the same commodity which can add some complexity and potential confusion

ASHRAE designations and chemical names

Table of ASHRAE designations ('R' numbers), for HFCs and HFOs used in this policy brief, with their chemical names. *ASHRAE designations are often presented with the prefix 'R' , for example: R-134a for HFC-134a.*

ASHRAE designation	Chemical Name
HFC-14	Tetrafluoromethane
HFC-23	Trifluoromethane
HFC-32	Difluoromethane
HFC-41	Fluoromethane
HFC-152	1,2-difluoroethane
HFC-152a	1,1-difluoroethane
HFC-125	Pentafluoroethane
HFC-143a	1,1,1-trifluoroethane
HFC-143	1,1,2- trifluoroethane
HFC-134a	1,1,1,2-tetrafluoroethane
HFC-134	1,1,2,2-tetrafluoroethane
HFC-227ea	1,1,1,2,3,3,3-heptafluoropropane
HFC-236cb	1,1,1,2,2,3-hexafluoropropane
HFC-236ea	1,1,1,2,3,3-hexafluoropropane
HFC-236fa	1,1,1,3,3,3- hexafluoropropane
HFC-245fa	1,1,1,3,3-pentafluoropropane
HFC-245ca	1,1,2,2,3-pentafluoropropane
HFC-365mfc	1,1,1,3,3-pentafluorobutane
HFC-43-10mee	1,1,1,2,2,3,4,5,5,5- decafluoropentane
HFO-1234yf	2,3,3,3-tetrafluoropropene
HFO-1234ze(E)	1,3,3,3-tetrafluoropropene
HFO-1336mzz(Z)	1,1,1,4,4,4-hexafluoro-2-butene

Useful OzonAction Smartphone Application -
Help in understanding HFC Terminology

WhatGas?

The OzonAction "WhatGas?" application allows you to quickly find information on any specific refrigerant or refrigerant blend/mixture as well as other ozone depleting substances, hydrofluorocarbons (HFCs) and alternative chemicals. Information includes:

- **Harmonised System (HS) codes**
- Chemical name, formula, and type
- ASHRAE designation
- Trade names
- Chemical Abstract Service (CAS) and United Nations (UN) numbers
- Montreal Protocol Annex and Control measures
- Ozone depleting potential (ODP), Global warming potential (GWP)
- Blend/mixture components
- Toxicity and flammability class
- Main uses

Search for "UNEP" or "WhatGas?" in the Apple and Google Play stores

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Desktop version also available (use on any internet connected computer)
www.unenvironment.org/ozonaction/resources/what-gas/what-gas

All OzonAction applications are available at no cost.

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References

1. The Kigali Amendment reached the minimum number of ratifications required to enter into force on 1 January 2019.
2. This publication uses the terminology '*Mixtures*' (as used in the WCO HS documentation) to describe commodities containing two or more ozone-depleting substances or alternatives. It should be noted that the term '*Blends*' is also frequently used in the context of refrigerants. For example ASHRAE and the Montreal Protocol's Technology and Economic Assessment Panel use the terminology: '*Refrigerant Blends*'.
3. For more information see:
http://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized-system.aspx
4. Recommendation of the Customs Co-operation Council on the insertion in national statistical nomenclatures of subheadings to facilitate the collection and comparison of data on the international movement of substances controlled by virtue of the Kigali Amendment to the Montreal Protocol on substances that deplete the ozone layer
http://www.wcoomd.org/-/media/wco/public/global/pdf/about-us/legal-instruments/recommendations/hs/recommendation_kigali.pdf?la=en
5. HFOs are not covered by the Kigali Amendment
6. 2903.399: Perfluoroisobutene and *"Includes all other HFCs and PFCs (and many other fluorinated, brominated and iodinated compounds not elsewhere classified)".* The classification system used in Colombia also incudes a number of 'Other' categories for example for: Other Fluorinated, brominated or iodinated derivatives of methane (2903.3919), Other Fluorinated, brominated or iodinated derivatives of ethane (2903.3929) and Other Fluorinated, brominated or iodinated derivatives of propane (2903.3939).
7. The proposal also includes new codes for some other substances which are not HFCs, e.g: methyl bromide (bromomethane) 2903.61
8. The updates to HS 2022 were adopted in June 2019, however, there is a six month objection period before they are final. No objections are expected for these codes.

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