



IAEG
INTERNATIONAL AEROSPACE
ENVIRONMENTAL GROUP

{HFCs} HYDROFLUOROCARBONS PHASED DOWN

US EPA methodology for phasing down HFCs over the next two years



WHAT'S HAPPENING

On 5 October 2021, in support of the commitments of the Montreal Protocol of 1987, US EPA the United States Environmental Protection Agency (EPA) published a final rule to set out the methodology for phasing down HFCs over the next two years. HFCs are potent greenhouse gases used in:



REFRIGERANTS



FOAM BLOWING AGENTS



SOLVENTS



AEROSOLS



FIRE SUPPRESSANTS



PROPELLANTS

The final rule is the first ruling under the American Innovation and Manufacturing (AIM) Act of 2020 to implement the HFC phasedown. It incorporates EPA's provisions that were given in the proposed rule. It also implements a request from industry groups to seek a longer time frame for setting baseline HFC allowances. The final rule sets out the baseline HFC production and consumption levels and caps emissions at 90% of baseline levels through the end of 2023.

Future regulations will implement further HFC reductions up through 2036; an 85% reduction in the production and consumption of 18 types of HFCs by 2036 is required. An electronic tracking system has also been established to ensure compliance with the phasedown requirement by tracking the movement of HFCs through commerce.



EXEMPTIONS are given for essential uses where a suitable alternative is not available, for export-bound domestic manufacturing, and in feedstocks and process agents.

APPLICABILITY

The final rule applies to any person that produces, transforms, destroys, imports, exports, sells or distributes, offers for sale or distribution, recycles for fire suppression, or reclaims a regulated substance. This rule also applies to end-users in the following six application-specific categories:

Self-defense (pepper or bear) sprays

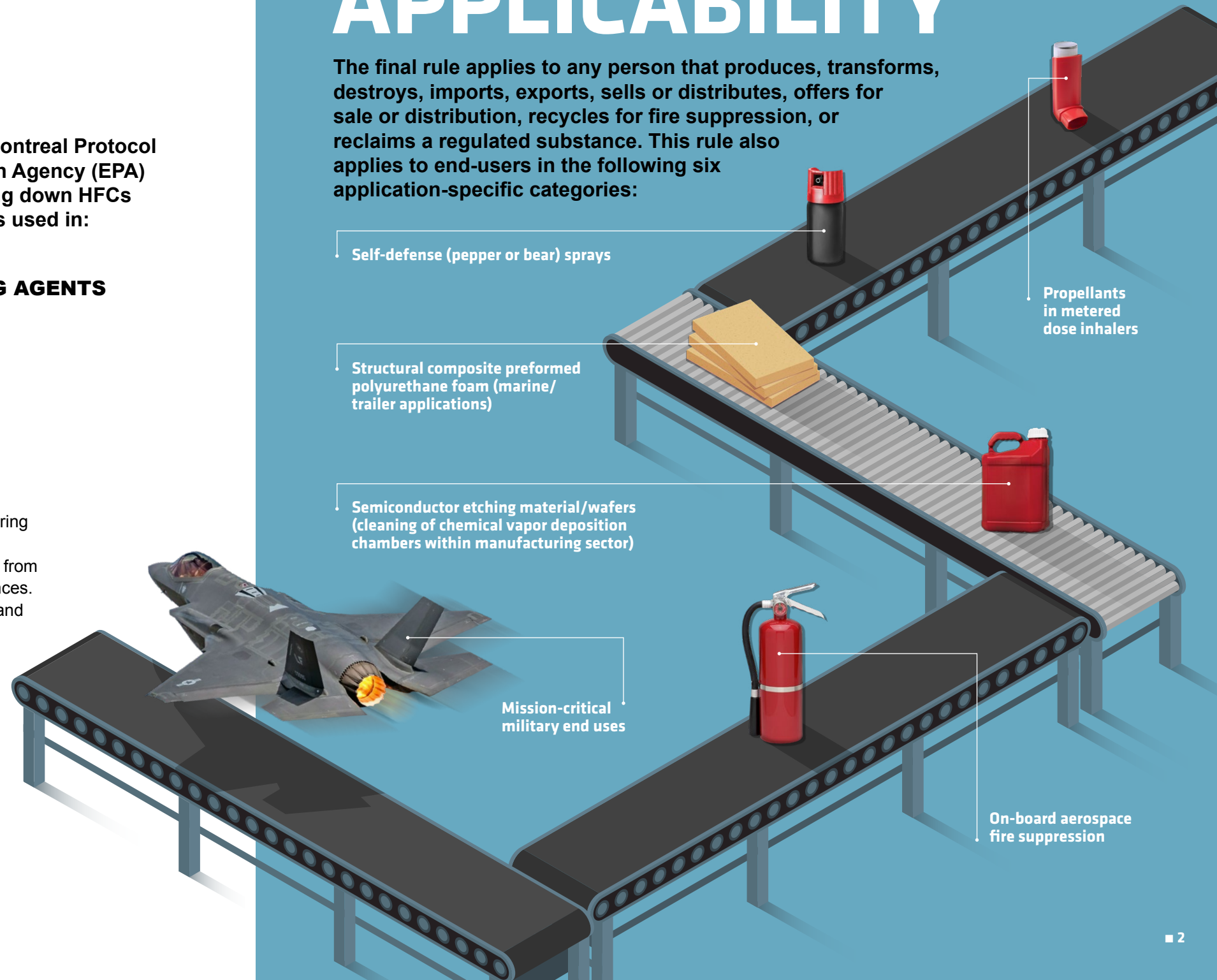
Structural composite preformed polyurethane foam (marine/trailer applications)

Semiconductor etching material/wafers (cleaning of chemical vapor deposition chambers within manufacturing sector)

Mission-critical military end uses

Propellants in metered dose inhalers

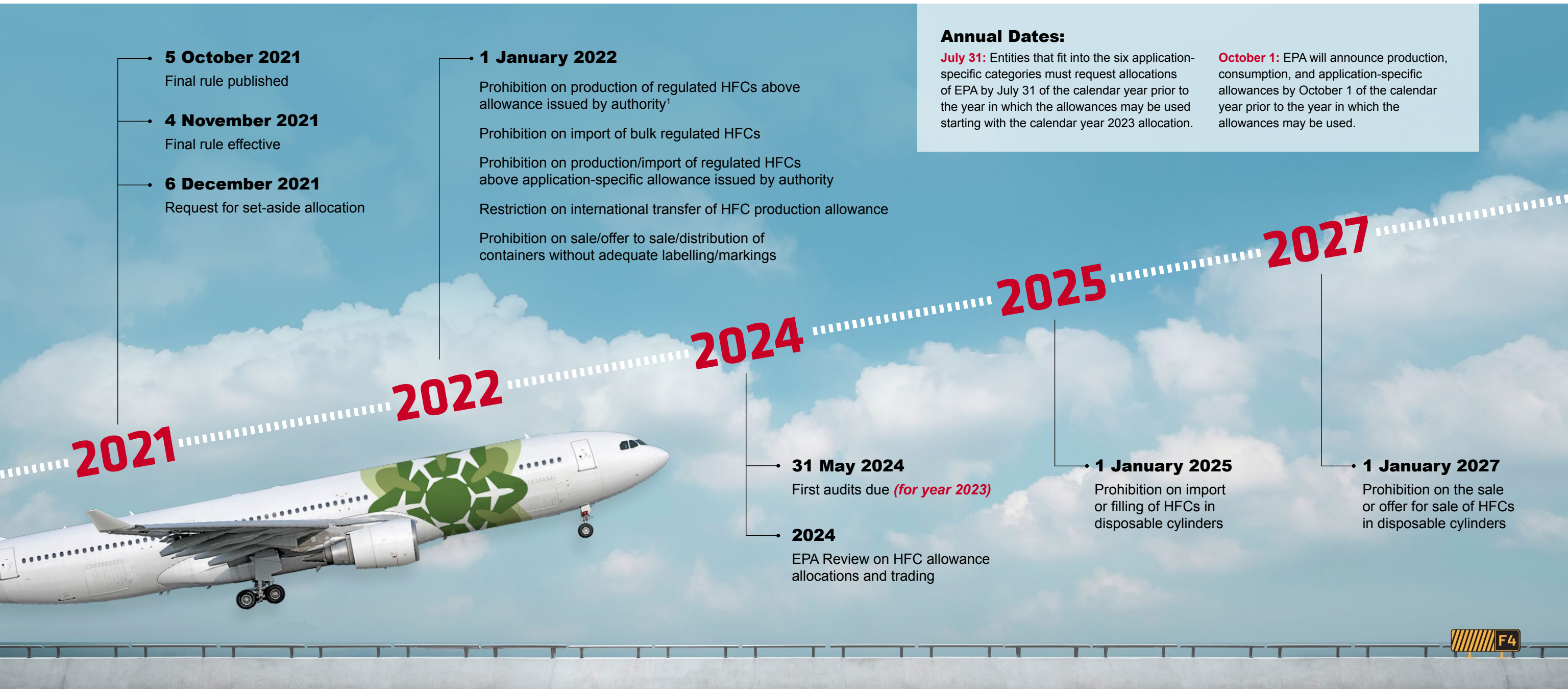
On-board aerospace fire suppression



RELEVANT DATES



¹The regulated substances that are produced must be consumed or destroyed under 40 CFR 84.29 within 30 days (if destruction technology is located at the production facility) or 120 days (if destruction technology is not located at the production facility).



- **5 October 2021**
Final rule published
- **4 November 2021**
Final rule effective
- **6 December 2021**
Request for set-aside allocation

- **1 January 2022**
Prohibition on production of regulated HFCs above allowance issued by authority¹
Prohibition on import of bulk regulated HFCs
Prohibition on production/import of regulated HFCs above application-specific allowance issued by authority
Restriction on international transfer of HFC production allowance
Prohibition on sale/offer to sale/distribution of containers without adequate labelling/markings

Annual Dates:

July 31: Entities that fit into the six application-specific categories must request allocations of EPA by July 31 of the calendar year prior to the year in which the allowances may be used starting with the calendar year 2023 allocation.

October 1: EPA will announce production, consumption, and application-specific allowances by October 1 of the calendar year prior to the year in which the allowances may be used.

2024

- **31 May 2024**
First audits due (*for year 2023*)
- **2024**
EPA Review on HFC allowance allocations and trading

2025

- **1 January 2025**
Prohibition on import or filling of HFCs in disposable cylinders

2027

- **1 January 2027**
Prohibition on the sale or offer for sale of HFCs in disposable cylinders

REGULATORY OBLIGATIONS

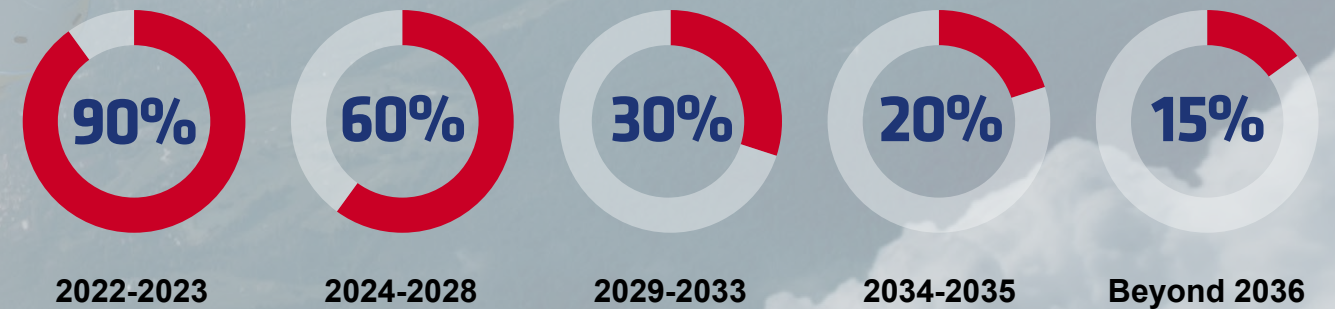
RESTRICTIONS

The provisions in the rulemaking can be divided into six specific areas, which are outlined in more detail on the following pages.

1

Production and consumption baselines

The production and consumption baselines, from which the phasedown is to be measured, were calculated and determined to be 382.6 and 303.9 million metric tons of exchange value equipment (MMTEVe), respectively as referenced in 40 CFR 84.7(b). The phasedown schedule outlined below shows HFC production and consumption limits from baseline that must be maintained between the time period shown:



*% OF BASELINE

2

Application-specific allowances

- These allowances can be expended for either production or import of HFCs
- End users in these applications may not know in advance how they will procure HFCs and will benefit from the flexibility offered by these allowances
- EPA issued application-specific allowances for the following essential-use applications:
 - 1) propellants in metered dose inhalers
 - 2) self-defense sprays such as pepper or bear spray
 - 3) structural composite preformed polyurethane foam used in marine and trailer applications
 - 4) In the etching of semiconductor material or wafers and the cleaning of chemical vapor deposition chambers within the semiconductor manufacturing sector
 - 5) mission-critical military end uses
 - 6) on-board aerospace fire suppression
- Allocations are non-transferable

3

Allocation allowances

Production allowances

- The total HFC production allowance for 2022 and 2023 is 344.3 MMTEVe

Consumption allowances

- The total HFC consumption allowance for 2022 and 2023 is 273.5 MMTEVe
- By 1 October 2021, EPA is expected to issue the 2022 allocation to HFC producers and importers considered active in 2020. Allocations will be based on the three highest years of production or consumption between 2011 and 2019

4

Set-aside allowances

- A small portion (< 3%) of the 2022 allowance, 7.5 MMTEVe, will be set aside for companies that are end users in currently unidentified application-specific sectors, qualifying importers of HFCs who have not yet been identified, and new importers
- Companies in the above-mentioned categories should have submitted allowance applications by 6 December 2021

5

HFC-23 (CHF₃) controls

- Given that HFC-23 is more difficult to destroy than other HFCs, entities creating HFC-23 have the option to destroy it using approved technology or to expend the production and consumption allowances to capture, refine, and sell it for further consumption (e.g., semiconductor etching)
- After 1 January 2022, no more than 0.1% of HFC-23 produced on a facility line may be emitted



***CAS NUMBERS** were not provided in the Final Rule but have been added below.

6

Enforcement and compliance system

- Non-compliance will result in administrative consequences for allowance recipients
- The sale or distribution or offer to sell or distribute HFCs contained in non-refillable cylinders or those not meeting the certification ID requirements is prohibited
- The EPA will increase their oversight of HFC imports including transshipments and HFCs imported for transformation
- Establishment of a certification ID tracking system using QR codes for the import, sale, and distribution of containers containing HFCs
- External audits for all entities that received application-specific allowances

PRODUCTION AND CONSUMPTION DATA

on HFCs provided to EPA by companies will be released to the public to increase transparency. The following substances are listed as Regulated Substances in the AIM Act.



HFC



CHEMICAL FORMULA



CAS NUMBER*

If a company uses blends of HFCs, they should be broken down to the lower level substances listed in the table for purposes of compliance with this regulation.

HFC-134	CHF_2CHF_2	359-35-3
HFC-134a	CH_2FCF_3	811-97-2
HFC-143	CH_2FCHF_2	430-66-0
HFC-245fa	$\text{CHF}_2\text{CH}_2\text{CF}_3$	460-73-1
HFC-365mfc	$\text{CF}_3\text{CH}_2\text{CF}_2\text{CH}_3$	406-58-6
HFC-227ea	$\text{CF}_3\text{CHF}_2\text{CF}_3$	431-89-0
HFC-236cb	$\text{CH}_2\text{FCF}_2\text{CF}_3$	677-56-5
HFC-236ea	$\text{CHF}_2\text{CHF}_2\text{CF}_3$	431-63-0
HFC-236fa	$\text{CF}_3\text{CH}_2\text{CF}_3$	690-39-1
HFC-245ca	$\text{CH}_2\text{FCF}_2\text{CHF}_2$	679-86-7
HFC-43-10mee	$\text{CF}_3\text{CHFCH}_2\text{CF}_2\text{CF}_3$	138495-42-8
HFC-32	CH_2F_2	75-10-5
HFC-125	CHF_2CF_3	354-33-6
HFC-143a	CH_3CF_3	420-46-2
HFC-41	CH_3F	593-53-3
HFC-152	$\text{CH}_2\text{FCH}_2\text{F}$	624-72-6
HFC-152a	CH_3CHF_2	75-37-6
HFC-23	CHF_3	75-46-7



WORTH THE RISK?

Violation of this regulation may result in banning the company and its owner(s) from receiving future allowances from EPA resulting in disruption to the business and supply chain. Companies may not have identified all uses of a regulated substance, and furthermore may not have identified a use as fitting within one of the six categories of application-specific allowance. Although a company may not be directly impacted by this regulation, the site may be impacted by future limited availability of a product thus resulting in increased costs to programs.

RISK MITIGATION:



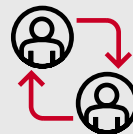
IDENTIFY

where regulated HFCs are present in your products, processes, facilities, and the supply chain



DETERMINE

how this regulation impacts your business including if your company is regulated under any of the six application-specific categories



COMMUNICATE

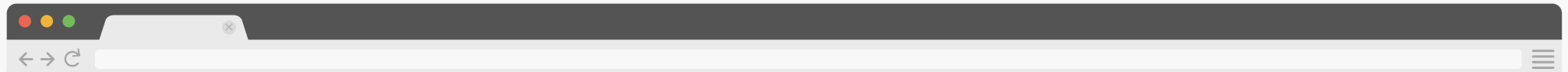
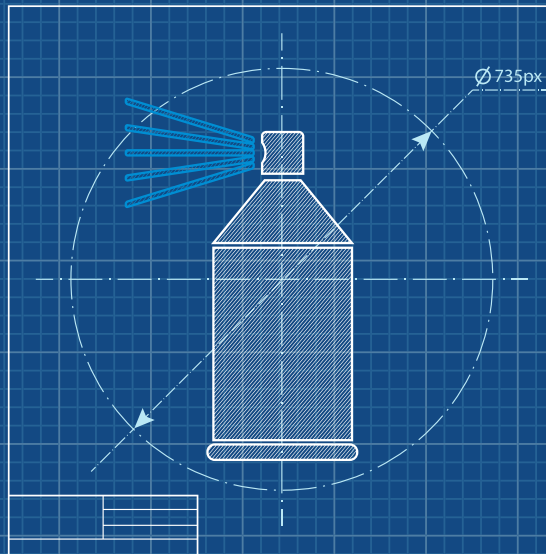
with the Department of Defense to determine if they have a process in place to comply with mission-critical military end uses



ENGAGE

with site programs and engineering groups to understand where products containing the regulated HFCs are used





By 2036, all HFCs will be phased out for use and consumption completely.

✗ FALSE

Unlike previous rules that completely phased out the use of the ozone depleting substances, The AIMS Act will phaseout 85% of the HFC production by 2036.

Companies using HFCs in the application-specific categories are exempt from the requirements of the AIMS Act.

✗ FALSE

Companies using HFCs in these application-specific categories are responsible for requesting an allocation of HFCs from EPA by 31 July of each year starting for allocation year 2023. Failing to request needed allocations for an application-specific use could result in business disruption if HFC availability on the open market is limited.

HFC reductions after 2023 will be regulated by future regulations that EPA plans to implement.

✓ TRUE

While this rule requires an 85% reduction in production and consumption of HFCs by 2036, EPA will be developing new regulations to implement the further reduction for years 2024 to 2036.

Non-compliance with allocation requirements could result in consequences for allowance recipients.

✓ TRUE

Failure to comply with allowance limits could result in the agency retiring, revoking, withholding or outright banning a company from future allowance allocations. (86 FR55221)



RESOURCES

Phasedown of HFCs Final Rule

<https://www.federalregister.gov/documents/2021/10/05/2021-21030/phasedown-of-hydrofluorocarbons-establishing-the-allowance-allocation-and-trading-program-under-the>

IAEG WG9 Regional HFC Alert

https://www.iaeg.com/elements/pdf/Alert19-2021_HFC_Alert_USA.pdf

Kigali Amendment to the Montreal Protocol

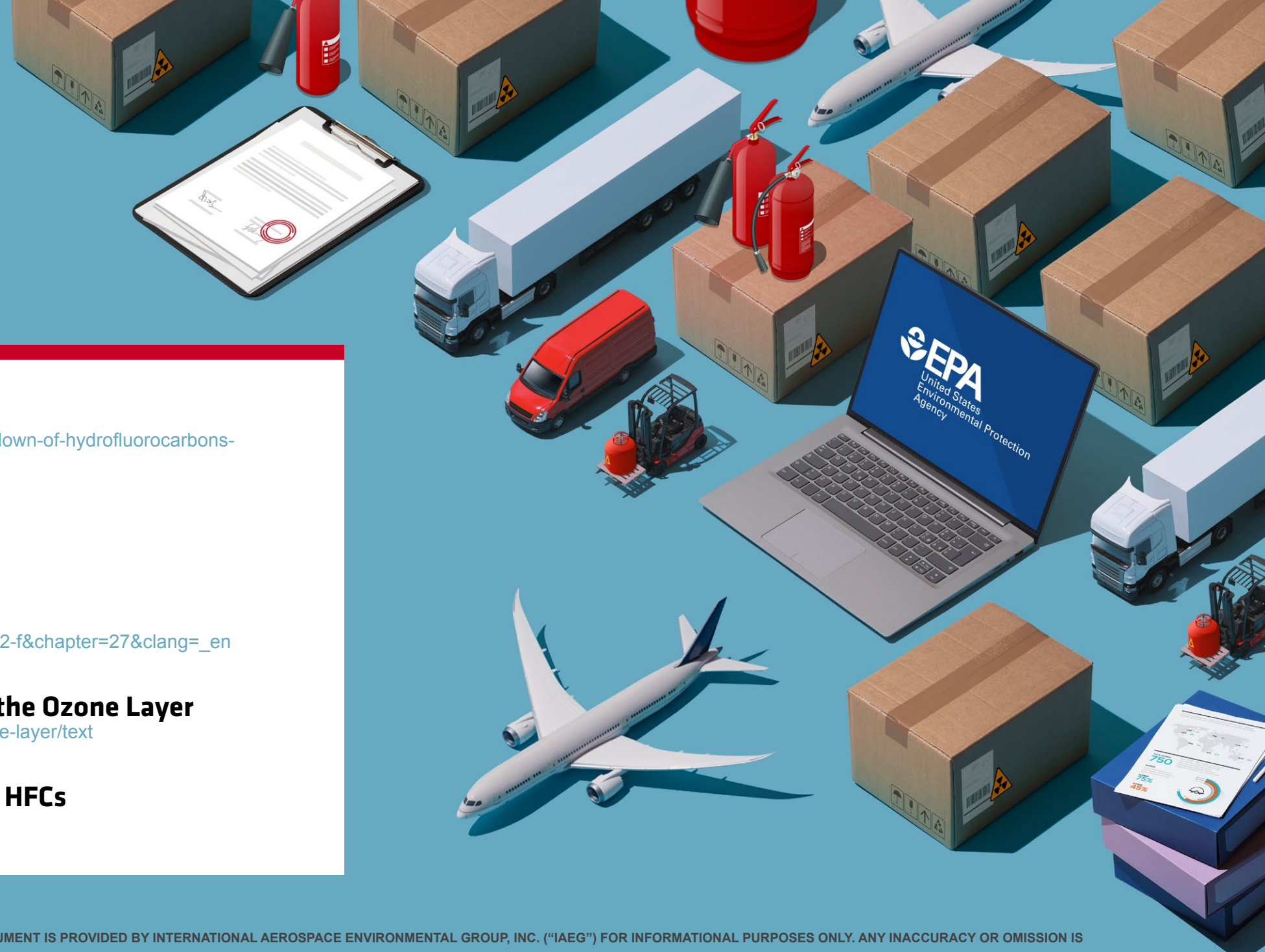
https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-2-f&chapter=27&clang=_en

The Montreal Protocol on Substances that Deplete the Ozone Layer

<https://ozone.unep.org/treaties/montreal-protocol-substances-deplete-ozone-layer/text>

US EPA: Protecting Our Climate by Reducing Use of HFCs

<https://www.epa.gov/climate-hfcs-reduction>





LEADING EDGE
SOLUTIONS
ACROSS THE
VALUE CHAIN



RESPONSIBLE &
SUSTAINABLE
AEROSPACE
INDUSTRY

A RECOGNIZED GLOBAL BODY FOR AEROSPACE & DEFENSE

46 MEMBER
COMPANIES

70% OF GLOBAL AEROSPACE & DEFENSE
INDUSTRY ARE IAEG MEMBERS

\$488B COMBINED ANNUAL 2020 REVENUES
FOR IAEG (FULL) MEMBERS

\$697B TOTAL GLOBAL AEROSPACE
INDUSTRY 2020 REVENUES

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BAE Systems
Boeing
Bombardier
Dassault Aviation
De Havilland Aircraft of Canada Limited
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