

Introduction to support mechanisms and Infrastructure for LRM

**Japan Refrigerants and Environment Conservation Organization
(JRECO)**

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Jul 15, 2026

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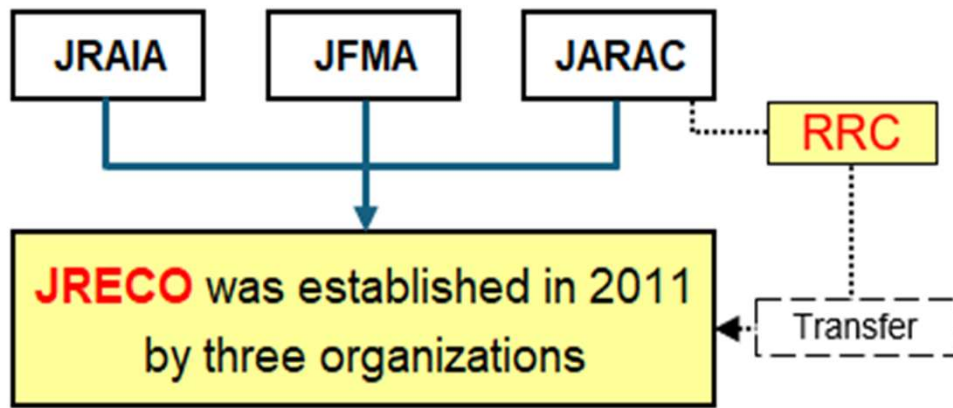
1. Overview of JRECO

2. Refrigerant Management System (RaMS)

**3. Certification Program of refrigerant
reclamation plant**

**4. Training and certification of Technicians
handling fluorocarbon refrigerants**

1. Overview of the Japan Refrigerants and Environment Conservation Organization (JRECO)



Organization Members: 22 organizations
Corporate Members: 28 companies

(As of August 28, 2025)

JRAIA : The Japan Refrigeration and Air Conditioning Industry Association

JFMA : Japan Fluorocarbon Manufacturers Association

JARAC : Japan Association of Refrigeration and Air-Conditioning Contractors

RRC (Refrigerant Recycling Promotion and Technology Center) was transferred to **JRECO** from **JARAC** in 2011.

- An organization that promotes projects related to the reduction of atmospheric emissions of fluorocarbon refrigerants from refrigeration and air conditioning equipment, the rational use of such refrigerants, and the proper management thereof, in order to protect the ozone layer and prevent global warming, through cooperation with relevant business operators and collaboration with governmental authorities.

Main Activities of JRECO Introduction item 1.2.3

1. Development and provision of a fluorocarbon management tool (RaMS)

2. Certification programs for Refrigerant reclamation plant.(RRC)

3. Development of reliable technician, and operation of certification programs for the following personnel:

Fluorocarbon Refrigerant Handling Technician (Class-II),
Refrigerant Recovery Technician. (RRC)

4. Sale of process management forms and stickers

5. Policy cooperation (serving as the implementing and administrative organization for MOE subsidy programs)

6. Dissemination and awareness-raising of laws and regulations

7. Information dissemination related to refrigerants

1.JRECO activities history related to introduction item

Year	Law and Regulation in Japan & International	JRECO Activity item 1.RaMS 2.Certification Program for Refrigerant reclamation plant 3.Training	Related activity by Other association
1987	MOP*1 adopted		
1988	Ozone Layer Protection Law		
1992	UNFCCC*2 adopted		
1994		 - Started for Refrigerant Recovery Technician Certification 1994 - Certification programs for Refrigerant reclamation plant 1994	
2002	Law concerning the Recovery and Destruction of Fluorocarbons		R-12,R-502,R-22,R-134a
2010			JARAC Started for Class-I Fluorocarbons Handling Technician Certification
2011		★JRECO est.1.Refrigerant Recovery Technician Certification 2.Certification programs for Refrigerant reclamation plant 3. Digitally supported Process Management Form	
2014		Started for Class-II Fluorocarbons Handling Technician Certification(JRECO)	
2015	Act on Rational Use and Proper Management of Fluorocarbons	- Logbook function was added - Report on Calculated Amount of Leaked Fluorocarbons Recycling and Destruction Certificate - Compliant with Rational Use and Proper Management of Fluorocarbons	
2016	Kigali Amendment adopted		- JARAC revised JRC GL-01. - Issuance of Guideline for Fluorocarbons Filling (JRC GL-02)
2018	Ozone Layer Protection Law (Amended): Regulating HFC production	Added on RaMS-ex (Data Analysis System & supported inventory of Equipment/Refrigerant)	
2020	Act on Rational Use and Proper Management of Fluorocarbons (Amended)	Updated RaMS system complied to Rational Use and Proper Management of Fluorocarbons (Amended)	
2024		Refrigerant (HFC include mixed refrigerant) was added to Certification programs for Refrigerant reclamation plant	R-404A,R-407C,R-410A,R-507A,R-32

2.Refrigerant Management System - RaMS

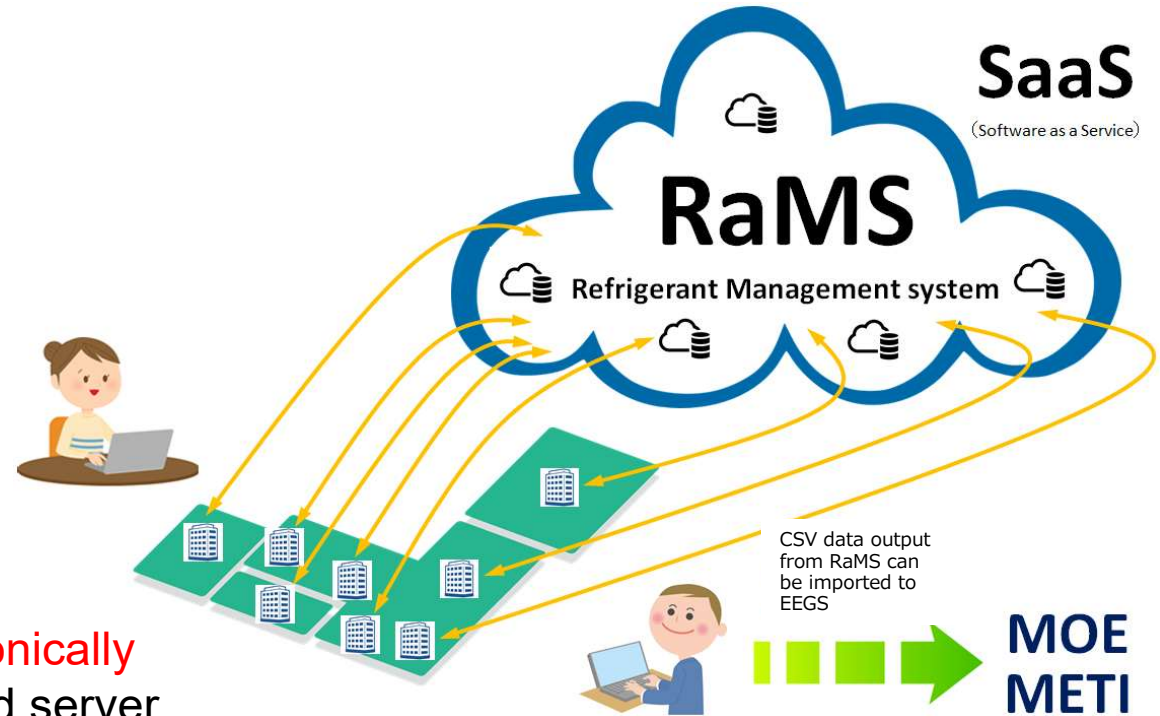
Refrigerant Management System

2-1.What is RaMS?

It is a database built on the cloud, equipped with data analysis function.

The system has robust security measures in place, ensuring that no third party can access individual RaMS data.

By logging into the system, you can **electronically register and store various data** on the cloud server.



<Login screen (<https://www.jreco.jp/>) >

<Main menu screen>

Data registration Workflow (Example of registering filling and collection information at the data center)

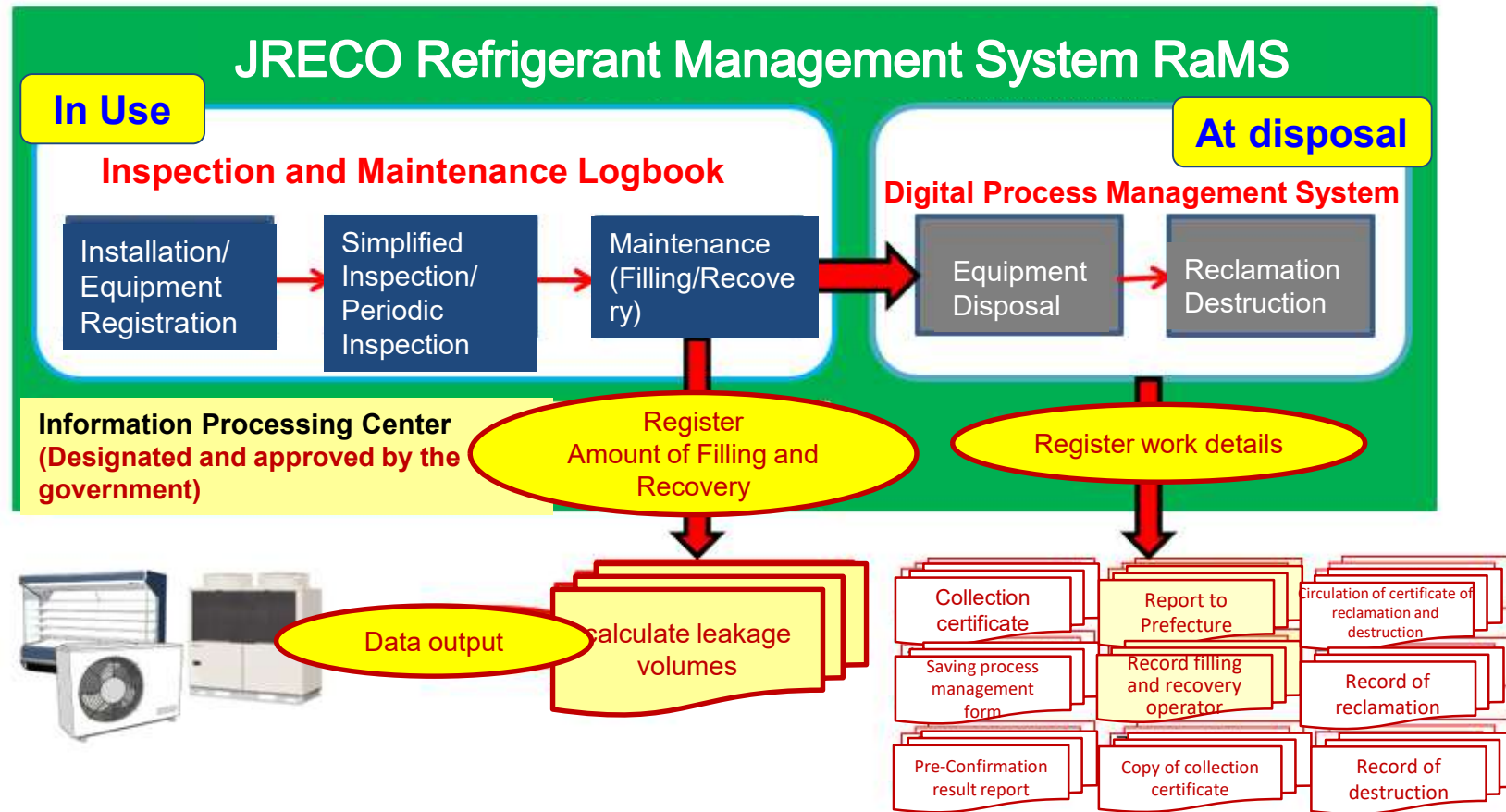
Step 1
Register
Company
Info
(free of
charge)

Step 2
Filling and
collection
contractors
Input data
100 JPY per
entry
(excl.tax)

Step 3
Data is
electronically
notified to the
administrator
Registration
complete

Note: All participating entities must first register their business location in RaMS (free of charge) and have access to web-based systems.

2-2. System Overview of RaMS



<Key Feature>

Core Functions (Information Processing Center Functions)※

Inspection and Maintenance Logbook (Logbook)

Issuance, delivery, and storage of Process Management Forms

Issuance and storage of Reclamation and Destruction Certificates

Issuance and storage of Pre-Confirmation Result Reports (effective from April 2020))

Issuance, circulation, and storage of Copies of Collection Certificates (effective from April 2020)

※ As stipulated by law, these functions support the registration of refrigerant filling and recovery data during equipment maintenance.

2-3.Advantages of using RaMS

Easy to calculate leakage amount

Free yourself from tedious aggregation work!
Print in designated format with just one click.

Centralized management with device management list

By displaying the equipment management list for each business location, you can easily check inspection timings and leakage amounts.

Data can be entered by the refilling and collection contractor

Anytime, anywhere, refrigerant recovery contractors who have conducted inspections and maintenance can input data, including data submission to the data center as required by law.

Efficiently manage and store logbooks electronically

You can be freed from recording and managing logbooks, and efficiently manage and store data electronically.

Preventing missed inspections through deadline notifications and color-coding on list

Fully compliant with the the Act on Rational Use and Proper Management of Fluorocarbons

The system also enables the disposal and handover of equipment

It allows you to create process management forms for equipment disposal and also to receive circulated recovery or destruction certificates.

Electronic centralized management of necessary documents

Free yourself from paper-based storage and management.
All document delivery and storage can be done electronically.

Control and manage business locations with up to three levels

The system allows business sites that own equipment to be easily linked in up to three hierarchical levels, significantly reducing the workload of headquarters staff.

Smooth handovers when administrator is replaced

RaMS makes it easy, convenient, and secure to handovers works.



Admin...
cloud management



Filling/Collection
Contractors



**It can be operated on a
tablet!**

(Ref) RaMS-ex Using RaMS Data Effectively

All data registered in RaMS can be aggregated, output, and printed free of charge.

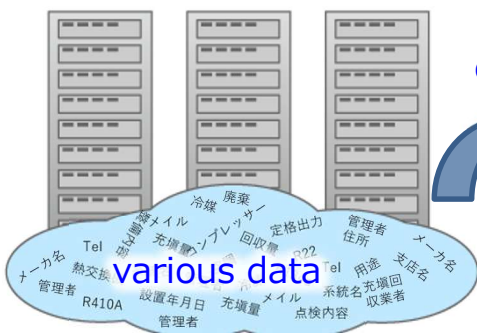
(information such as calculated leakage amount, filling and recovery volumes and proper management of equipment)

RaMS-ex (RaMS Excel Export)

Organize company data accumulated within RaMS into Excel templates to enable administrators to effectively utilize it.

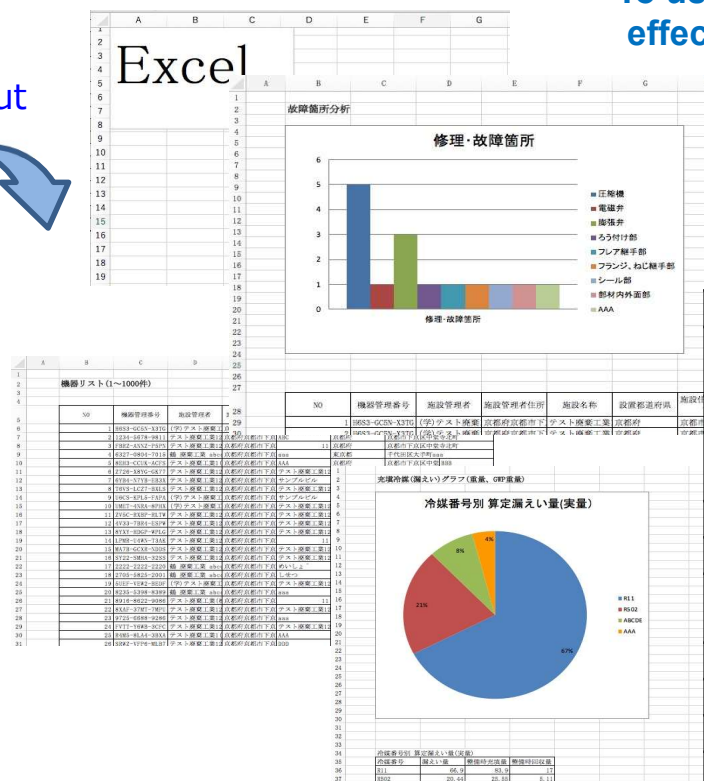
RaMS

Compliance and Evidence



RaMS-ex

To use data effectively



RaMS-ex

A wide range of output menus available **free of charge**.

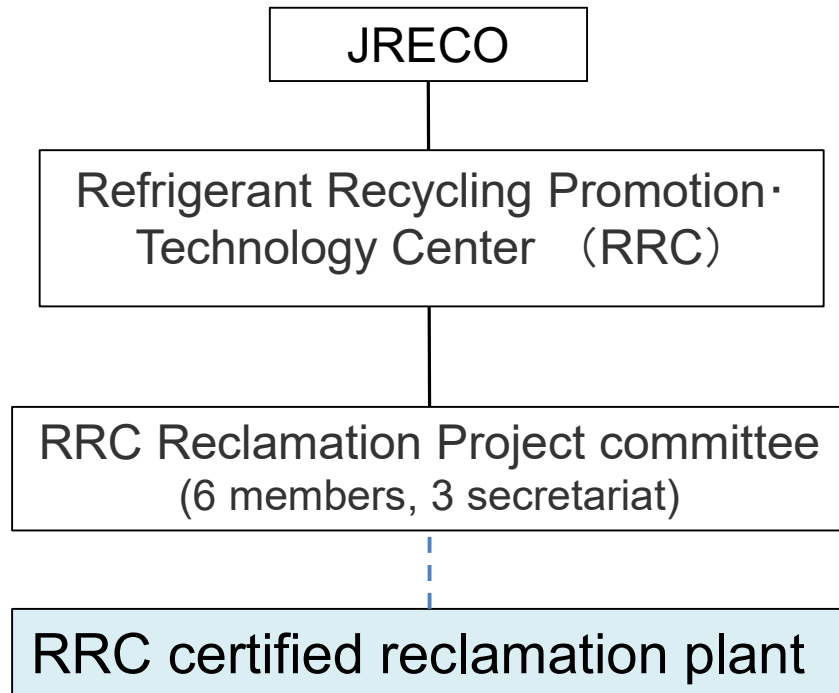
By understanding how many units of equipment and how much refrigerant your company owns, you can use this information to reduce costs and plan future equipment replacements.

The 11 types of management data are exported as an Excel file with separate sheets.

1	Equipment List
2	Refrigeration and Air Conditioning Equipment Management Record
3-1	Refrigerant inventory graph (weight, GWP weight)
3-2	Refrigerant inventory spreadsheet (weight, GWP weight)
4-1	Refrigerant filling chart (weight, GWP weight)
4-2	Refrigerant filling spreadsheet (weight, GWP weight)
5	List of Equipment in Use, Disposed Equipment, and Recovered Refrigerant Quantities at Disposal
6-1	Disposal equipment details via logbook (spreadsheet)
6-2	Disposal equipment details via logbook (chart)
7-1	Analysis of fault details (graph)
7-2	Analysis of fault details (spreadsheet)

3.Certification Program of refrigerant reclamation plant

3-1.Organization



Main activities

1. Development of regulations and quality standards
2. Certification review and Factory audit for approval
3. Factory audit during the certification period

3-2. Certification standards

1. Since the reclamation refrigerant is a high-pressure gas, the handling procedures and equipment for handling high-pressure gases during the refrigerant reclamation process must be appropriate.
2. The Plant must possess equipment (distillation purification method) capable of ensuring the reclamation purity that meets the quality standards for the reclamation refrigerant being certified , and must take appropriate measures to maintain quality.
3. The company must employ at least one certified refrigerant analysis technician.
4. The certification is valid for five years, and the Plant must undergo at least two audits within that period.

Operating Regulations

- Certification Regulations for Certified Refrigerant Fluorocarbon Reclamation Plant
- Operating Regulations for Certified Refrigerant Fluorocarbon Reclamation Plant
- Audit Regulations for Certified Refrigerant Fluorocarbon Reclamation Plant

Quality-Related Documents

- Reclaimed Refrigerant Fluorocarbon Quality Standards:
 - R-12, R-502, R-22, R-134a (RRC 1001)
 - HFC Refrigerant blends (RRC 1004)
 - R-32 (RRC 1007)
- Refrigerant Fluorocarbon Quality Control Manual:
 - R-12, R-502, R-22, R-134a (RRC 1003)
 - HFC Refrigerant blends (RRC 1006)
 - R-32 (RRC 1009)

HFC Refrigerant blends : R-404A,R-407C,R-410A,R-507A

3-3.Reclaimed Refrigerant Quality standard

(1) R-12, R-502, R-22, R-134a (RRC1001)

Item	R-12	R-502	R-22	R-134a	Remarks
Appearance	Colorless and free from visible contamination				
Purity (Area %)	≥ 99.78	≥ 99.78	≥ 99.78	≥ 99.78	Gas chromatographic value
All Other Volatile Impurity 1 ^{*1} (Area %)	≤ 0.02 (R-11)	≤ 0.02 (R-11, R-114)	≤ 0.02 (R-11)	≤ 0.02 (R-11)	
All Other Volatile Impurity 2 ^{*2} (Refrigerant area % excluding Impurity 1)	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	
Water (wt%)	≤ 0.001	≤ 0.001	≤ 0.002	≤ 0.002	
Acidity (wt%)	≤ 0.0001	≤ 0.0001	≤ 0.0001	≤ 0.0001	HCl equivalent value
Air and Other Non-condensables (vol%)	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5	Value in gas phase of cylinder
High-Boiling Residue (vol%)	≤ 0.01	≤ 0.01	≤ 0.01	≤ 0.01	Mainly refrigeration oil

Notes *1: Impurity 1 refers to substances that are easily generated by decomposition and therefore must be kept at a low level in the refrigerant.

*2: Impurity 2 refers to refrigerant impurities other than those classified as Impurity 1.

(3) HFC Refrigerant R-32 (RRC1007)

Item	Specification	Remarks
Appearance	Colorless and free from visible contamination	
Purity (wt%)	≥ 99.7 ^{*1}	Gas chromatographic value
Moisture (wt%)	≤ 0.002	
Acidity (wt%)	≤ 0.0001	HCl equivalent value
Air and Other Non-condensables (vol%)	≤ 1.5	Value in gas phase of cylinder
High-Boiling Residue (wt%)	≤ 0.01	Mainly refrigeration oil

Note*1: Chlorine-containing compounds as impurities shall be less than 0.2 wt%.

Furthermore, among these compounds, each ozone-depleting substance (ODS), such as R-22 and R-115, shall be less than 0.1 wt%.

(2) HFC Refrigerant Blends (RRC1004)

1) Refrigerant Composition and Allowable Tolerances

Refrigerant	Components	Composition and Tolerance (wt%)
R-404A	R-125 / R-143a / R-134a	44.0 ± 2.0 / 52.0 ± 1.0 / 4.0 ± 2.0
R-407C	R-32 / R-125 / R-134a	23.0 ± 2.0 / 25.0 ± 2.0 / 52.0 ± 2.0
R-410A	R-32 / R-125	50.0 (+0.5 / - 1.5) / 50.0 (+1.5 / - 0.5)
R-507A	R-125 / R-143a	50.0 (+1.5 / - 0.5) / 50.0 (+0.5 / - 1.5)

Note: The chemical formulas and chemical names of each component are shown below.

Refrigerant	Chemical Formula	Chemical Name
R-32	CH ₂ F ₂	Difluoromethane
R-125	CHF ₂ CF ₃	Pentafluoroethane
R-134a	CH ₂ FCF ₃	1,1,1,2-Tetrafluoroethane
R-143a	CH ₃ CF ₃	1,1,1-Trifluoroethane

2) Quality Standard

Item	Specification	Remarks
Appearance	Colorless and free from visible contamination	
Purity (wt%)	≥ 99.5 ^{*1, *2}	Gas chromatographic value
Moisture (wt%)	≤ 0.002	
Acidity (wt%)	≤ 0.0001	HCl equivalent value
Air and Other Non-condensables (vol%)	≤ 1.5	Value in gas phase of cylinder
High-Boiling Residue (wt%)	≤ 0.01	Mainly refrigeration oil

Notes*1 : Purity refers to the total concentration of all specified blend components.

*2: Chlorine-containing compounds as impurities shall be less than **0.2 wt%**. In addition, the concentration of each **ozone-depleting substance (ODS)**, such as R-22 and R-115, shall be less than **0.1 wt%**. Hydrocarbons, including propane, present as impurities shall be less than **0.3 wt%**.



3-4. RRC certified reclamation plant



一般財団法人 日本冷媒・環境保全機構
冷媒回収推進・技術センター

Refrigerants Recycling Promotion and Technology Center



Create Co. , Ltd
(Certification NO.0001)



Environmental Research Institute Chubu Co., Ltd.
(Certification NO.0005)



ABE Chemical Co. , Ltd
(Certification NO.0002)



Tsukamoto Air Conditioning Equipment Co., Ltd.
(Certification NO.0007)



4. Training and certification of technicians handling fluorocarbon refrigerants

4-1.Certification Type and Scope

	Class-I Fluorocarbons Handling Technician			Class-II Fluorocarbons Handling Technician			RRC Refrigerant Recovery Technician		
Scope of Certification	Maintenance	Recovery	Filling	Maintenance	Recovery	Filling	Maintenance	Recovery	Filling
	◎ (All equipment)	◎ (All equipment)	◎ (All equipment)	○ (certain equipment)*1	◎ (All equipment)	○ (certain equipment)*1	—	◎ (All equipment)	—
				*1 Rated output of compressor motor Air-conditioning: <25kw Refrigeration : <15kw					
Eligibility Requirement	● More than 3 years experiences ● Acquisition of national/private certifications related to air-conditioning and refrigeration under the guideline			● More than 3 years experiences			● No requirement		
Background	● This was originally an industrial certification for refrigerant leakage inspection technicians and established by JRAIA and JARAC. ● The government approved these technicians as one of the qualified technicians at the time of enforcement of FCs Act*1. ● The name was changed to “Class-I Fluorocarbons Handling Technician”.			● Class-II was developed for technicians who handle smaller equipment than Class-I at the time of enforcement of FCs Act.			● This was originally a voluntary certification for recovery technicians and established by RRC to supply high quality recovered refrigerant to reclamation facilities. ● The government approved these technicians as one of the qualified recovery technicians at the time of enforcement of FCs Recovery & Destruction Law.		

*1 FCs Act: Act on Rational Use and Proper Management of Fluorocarbons

4-2.Summary of Textbook(Fluorocarbons Handling Technician)

Ch. (class I)	Ch. (class II)	Title of Chap.	Contents
I-1	II-1	Environmental issues of fluorocarbon refrigerants	1. Basic point of fluorocarbons, 2. Ozone depletion issue, 3. Global warming issue, 4. Importance of recovery/recycle/reclamation (RRC, Class-I, II)
I-2	II-2	Relevant legislations and safety & health related to refrigerating & air-conditioning equipment	Relevant Japanese law/regulation (Act on Rational Use and Proper Management of Fluorocarbons, High Pressure Gas Act, regulations associated with health and safety, etc.) (RRC, Class-I, II)
	II-3	Basics of refrigeration system and diagnosis of operating condition	1.Basics of refrigeration (sensible heat, latent heat, refrigeration cycle, refrigeration oil), 2. p-h diagram, 3.Refrigerant state transitions during refrigeration operation
I-3		Guideline for prevention of refrigerant leakage from refrigerating & air-conditioning equipment (JRA GL-14)	This is prepared by Japan Refrigeration and Air Conditioning Industry Association (JRAIA) stipulates requirements of design, production, installation, operation, repair ,disposal, etc.
I-4	II-4	Rules for fluorocarbons handling technician of commercial refrigerating & air-conditioning equipment	Stipulation of certification system of Fluorocarbons Handling Technician (Class I, II)
I-5	II-5	Guideline for refrigerant leak inspection and repair (JRC GL-01)	This is prepared by Japan Association of Refrigeration and Air-Conditioning Contractors (JARAC) and stipulates leakage inspection method/procedure, periodical inspection, repair for leakage, record of inspection/repair, leakage prevention, etc.
	II-6	Recovery and refilling of fluorocarbons refrigerant	1.Recovery machine and ancillary equipment, 2.Refrigerant state transition, 3.Recovery work, 4.Filling work

4-3.Training Program Management Framework

	Qualifications	Organizations
Training Secretariat	Class I Refrigerant Handling Technician	JARAC
	Class II Refrigerant Handling Technician	JRECO
	• Creating regulations and operational procedure • Public announcement of training schedules • Administration of examination grading and compilation of results • Public announcement of successful candidates • Dispatch of registration certificates to successful candidates and renewal training participants • Dispatch of re-examination application forms to unsuccessful candidates • Management and maintenance of technician data • Recruitment of instructors and organization of instructor training sessions	



New and Renewal Training Courses
Member Organizations (37)
JRAIA Members(manufactures) (8)
• Decision of training dates and venues • Recruitment and document-based screening • Dispatch of answer sheets and related materials
• Distribution of textbooks to participants (New training courses only)

Renewal training is also conducted for updating latest information Class I & II certified technician for each 5 years

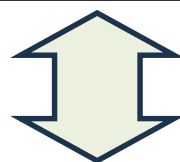
(Reference)

	Class I	Class II	RRC
Technicians	33,575	47,340	34,915

Note: The number of technicians (Type I and Type II) is as of February 28, 2026

Training Instructors: 334 (As of March 31, 2026)

Training Certification Committee	Secretariat: 3 organizations(9)
	Committee Members (7) Members recommended by the 3 organizations
4 in-person meetings/year 12 rounds of written deliberations /year/	• Preparation of implementation plans for training and renewal training • Preparation of textbooks and lecture outlines • Determination of examination questions and grading criteria • Determination of pass/fail results of examinations • Appointment of instructors



Training session scenes

Thank you