Z フロン

Freon

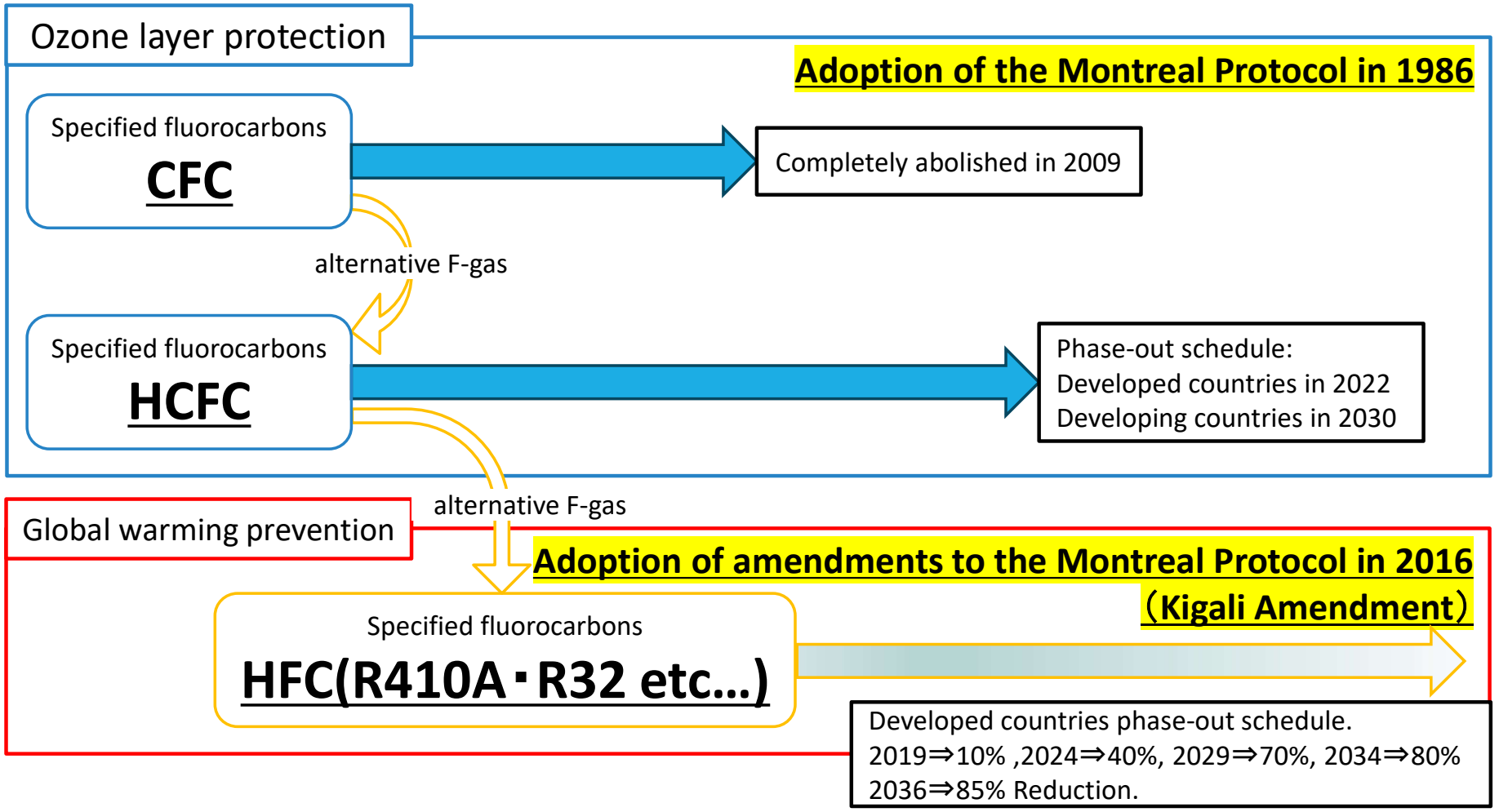
Refrigerant reclamation technique

MZ Group

Total support Japanese company for fluorocarbons.

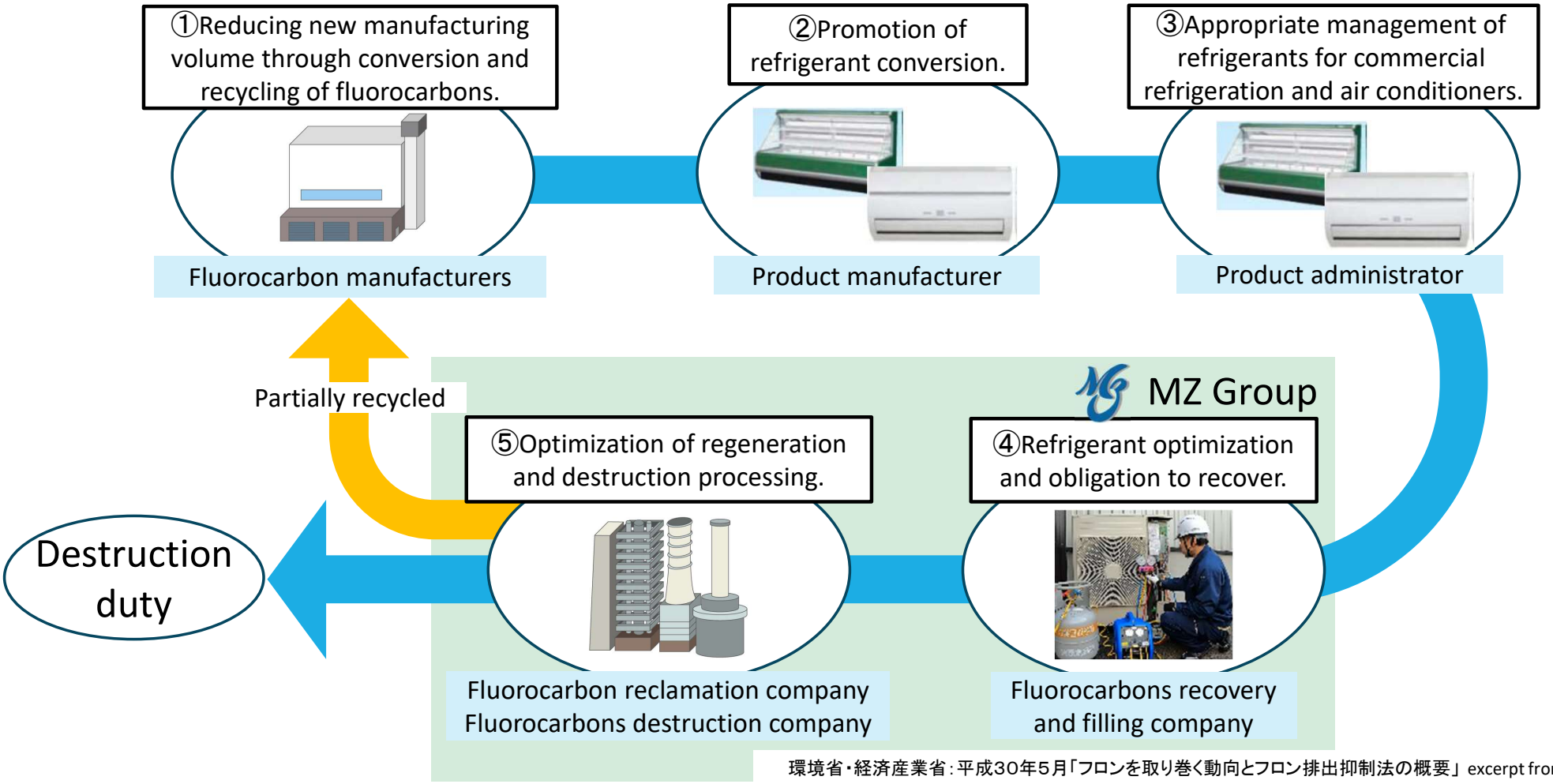
1. International flow of fluorocarbons.

●Under the Montreal Protocol, ozone-depleting substances have already been completely abolished in developed countries.
●Starting next year, major reductions in HFC emissions will begin in developed countries.



2. Regarding fluorocarbons emission control in Japan.

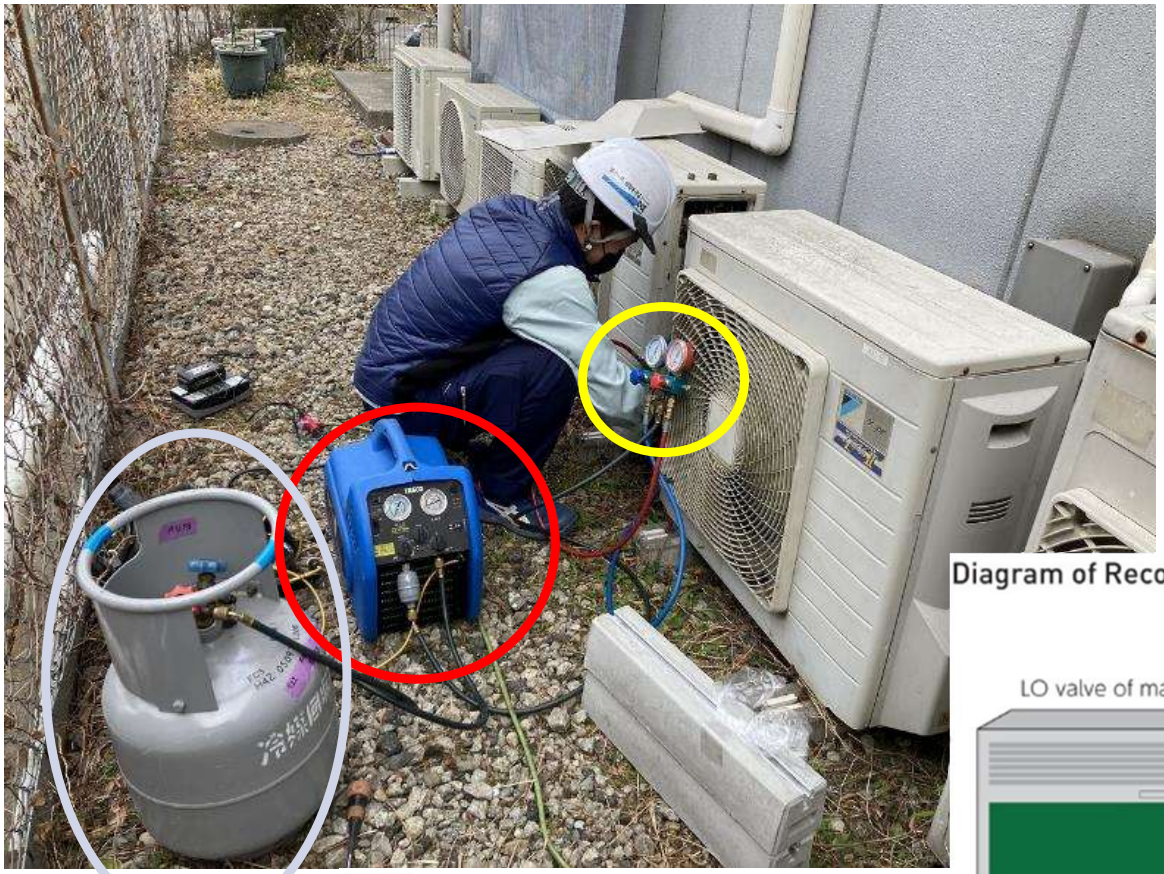
●In Japan, the "Freon Recovery and Destruction Law" was enacted in 2001.
In 2015, the law was revised to the "Freon Emissions Control Law" as a comprehensive measure covering the entire life cycle from manufacture to destruction of fluorocarbons.



環境省・経済産業省：平成30年5月「フロンを取り巻く動向とフロン排出抑制法の概要」 excerpt from

3. Japanese fluorocarbons recovery technology.

- When removing or updating a refrigeration air conditioner that contains fluorocarbons, be sure to recovery the fluorocarbons.
- It is important not to leak fluorocarbons during recovery, so reliable tools are essential.

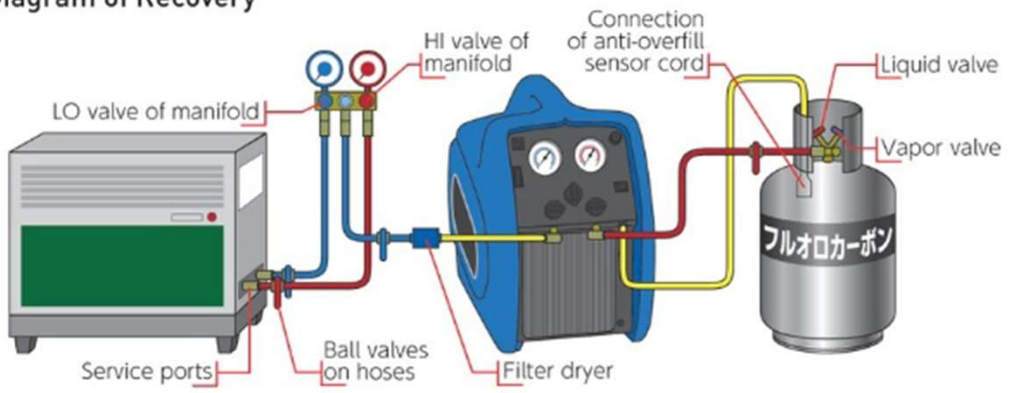


【Refrigerant Recovery Unit】
Fast recovery by superior condensing and cooling system.

【Recovery Cylinders】
The cylinder has two safety devices.
A fusible stopper and a float sensor.

【Ball Valve Manifolds】
Used for checking the vaporization state of refrigerant and for gas transfer and filling work.

Diagram of Recovery



ICHINEN TASCO

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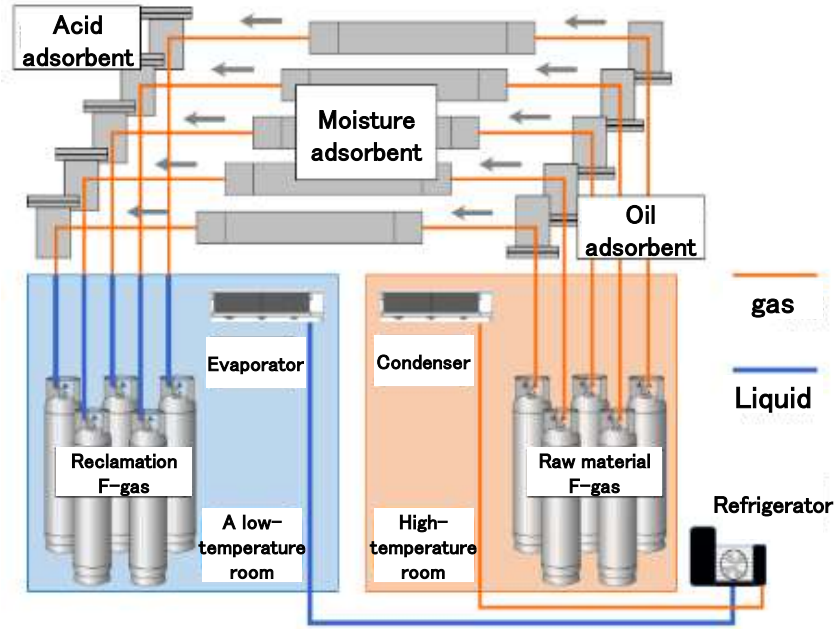
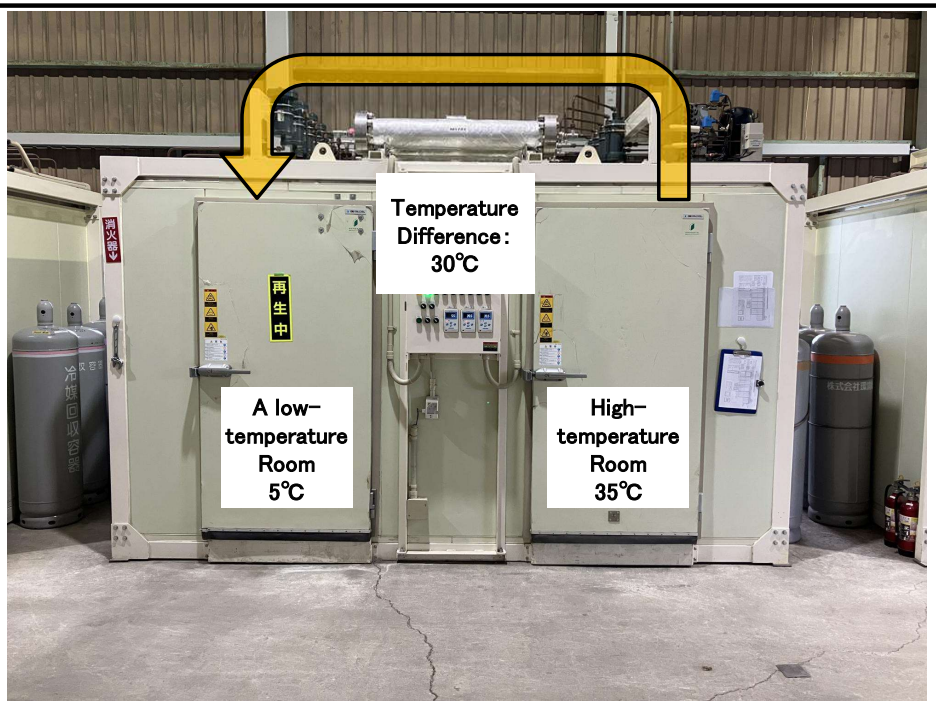
4. Japanese fluorocarbons reclamation technology.

●The reclamation equipment owned by MZ Group is extremely energy efficient. Research results have proven that it consumes less energy than destroying fluorocarbons and manufacturing new ones.



【Overview of reclamation device】

Highly energy-saving with reclamation processing using temperature difference.
Fluorocarbons vaporize in a high-temperature room, pass through each adsorbent, it is liquefied in a low-temperature room and completed as reclamation fluorocarbons.
Compatible refrigerant types：R410A・R32・R22・R404A・R407A etc…

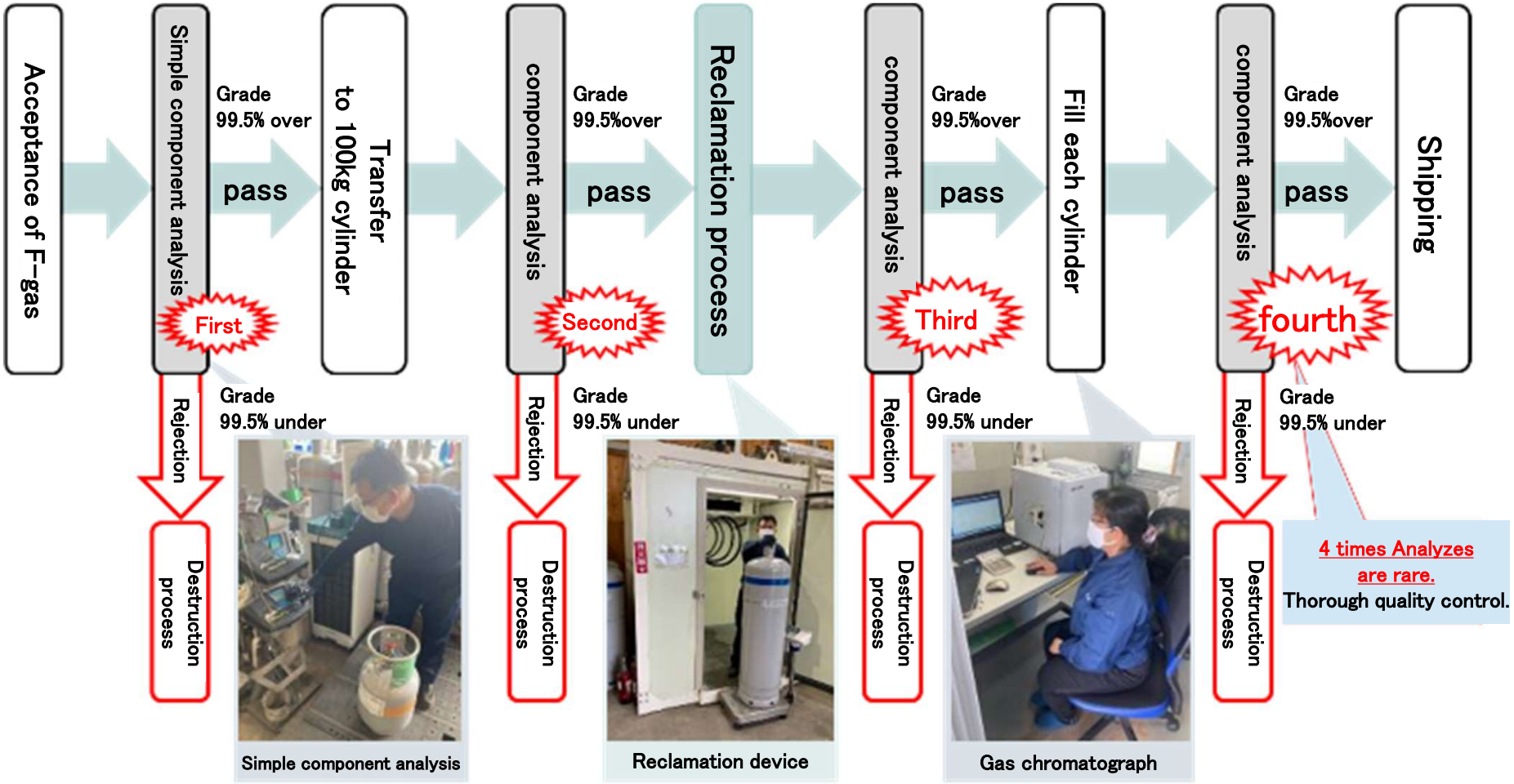


【Photo of reclamation device】

This is a playback device owned by MZ Group.
Reclamation device can process 500kg of fluorocarbons in two days.
A temperature difference of 30℃ can achieve the optimum refrigerant speed, ensuring that impurities are removed by circulation.

5. Japanese fluorocarbons quality control method.

- Quality : A total of 4 times component analysis are carry out.
- Device : Component analysis is performed using a highly accurate gas chromatograph.
- Rejected product : All rejected products will be destroyed.



6. Recovery technology awareness activities.

- At MZ Group, we are making videos for seminars.
- We will introduce how to cleanly remove from fluorocarbon with videos and demonstrations.

【Introduction videos to reclamation method】
Language：Japanese, English, Vietnam

【Introduction videos to recovery fluorocarbon method】
Language：Japanese, English, Vietnam

7. Fluorocarbons management using RefNEXT

- MZ Group manages the distribution of fluorocarbons with RefNEXT.
- RefNEXT allows you to see the amount of CO2 reduction and the reclamation rate.
- It is possible to extract recovery certificates and process control slips.

Achievements of fluorocarbons recovered by MZ Co.,Ltd. in 2022

Refrigerant type	Recovery amount [kg]	Reclamation amount [kg]	Destruction amount [kg]	Reclamation rate [%]
R410A	9,424	9,116	308	**96.7**
R32	29	24	5	**82.8**
R404A	88	88	0	**100.0**
R407C	804	449	355	**55.8**
R22	4,012	3,713	299	**92.5**
R134a	364	364	0	**100.0**
Etc.	280	277	3	**98.9**
Total	15,001	14,031	970	**93.5**

【Regarding CO2 emissions by processing of R410A】

★1t R410A：

- **When reclamation⇒2t CO2-eq/t.**
- **When destroying and newly manufacturing⇒14t CO2-eq/t.**

DATA：Sustainability Science ※https://www.mdpi.com/2071-1050/15/1/473

★From achievements,

Reclamation：9.116t×2 tCO2-eq = 18.232 tCO2-eq

Destroying：0.308t×14 tCO2-eq = 4.312 tCO2-eq

Total **22.544 tCO2-eq!!**

★If all destroying…

This means that 131.936 tCO2-eq were emitted.

We were able to reduce the amount by 109.392 tCO2-eq

【Utilization of RefNEXT】

★**Using the app, you can centrally manage fluorocarbon information, including traceability, in six steps: fluorocarbons recovery, accumulation and storage, reclamation and destruction, purity control, productization and reuse, and filling.**

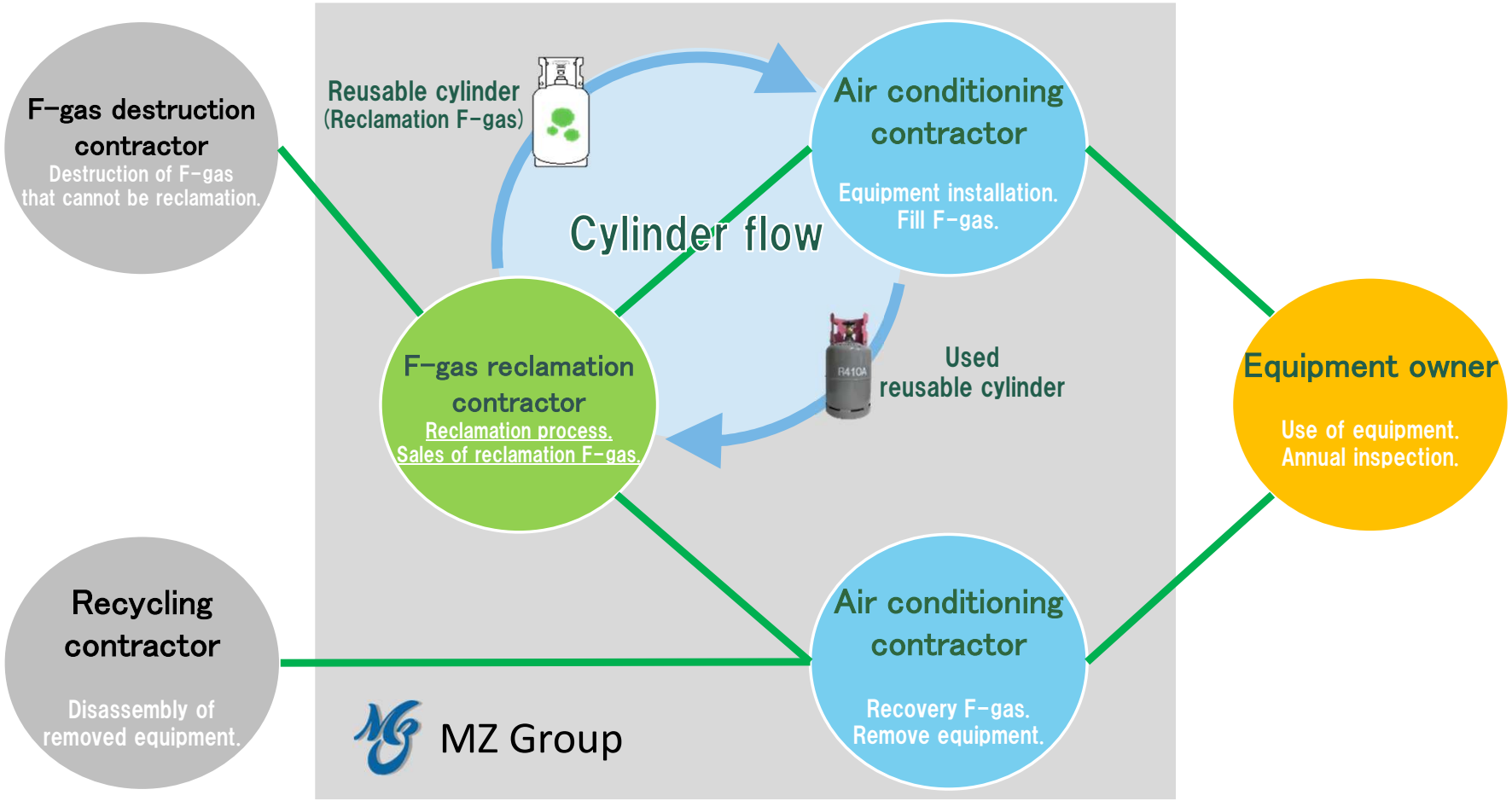
★**MZ Group has completely switched from an in-house developed system to RefNEXT.**

Paste QR code

Actual screen

8. MZ Group's approach

●We will contribute to the reduction of global warming by circulating limited resources.
●We will change from NRC cylinders to reusable cylinders
and contribute to the reduction of industrial waste.



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