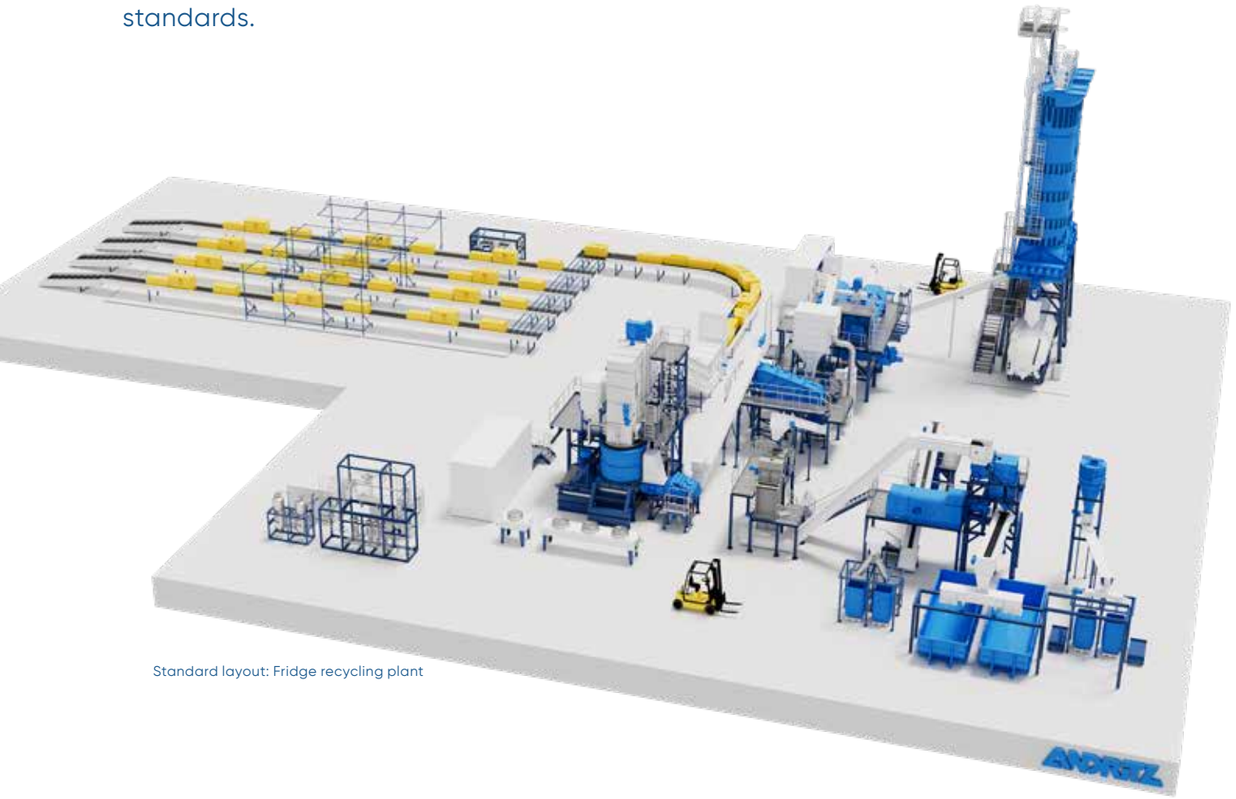
END-OF-LIFE FRIDGE RECYCLING

Turning fridges into valuable resources

ANDRITZ

ANDRITZ Fridge Recycling

ANDRITZ offers advanced fridge recycling systems designed to safely handle hazardous substances while maximizing the recovery of valuable materials. Our fully automated solutions ensure environmentally friendly processing of refrigerators—from degassing to material separation—meeting the highest safety and efficiency standards.



Standard layout: Fridge recycling plant

WHY ANDRITZ FOR FRIDGE RECYCLING?

What sets ANDRITZ apart in fridge recycling is the ability to combine efficiency, safety, and environmental responsibility in one advanced system. Our technology goes beyond conventional solutions by integrating innovative membrane separation for maximum propellant recovery, enclosed process stages that prevent harmful emissions, intelligent automation for precise material handling, and modular designs tailored to customer needs. From recovering valuable raw materials to ensuring the safe treatment of hazardous substances, ANDRITZ solutions are engineered to provide long-term value, operational reliability, and full compliance with the strictest environmental standards.

The process of fridge recycling

STAGE 1: FEEDING AND DEGASSING

ANDRITZ fridge recycling systems begin with the technology from ANDRITZ ATN Recovery Systems. The system enables the efficient recovery and separation of oil and cooling agents like CFC, iso-butane, and iso-propane. A wide range of customizable features can be integrated, including automation, fridge detection and categorization, blowing agent identification and labeling, as well as specialized tools like drilling heads or pliers. We also offer options for large industrial equipment, air conditioning units, and NH_3 equipment.

Feeding and degassing

STAGE 2: DISMANTLING & GAS RECOVERY

The recycling process begins with material feeding via an enclosed chain belt conveyor featuring a sluice feeding system, followed by one-step dismantling. The system operates in a closed environment, QZ housing, and one-way discharge unit, ensuring extremely low nitrogen consumption for inertisation. Continuous oxygen level monitoring guarantees safe operation. As insulation foam (PU) is milled down to powder, gases such as CFC and pentane are released and safely removed as nitrogen as carrier gas. Moisture from the fridges is reduced with the drying circuit during the shredding process.

The material is further processed in a closed system, where temperature is maintained using a tempering screw conveyor. Remaining blowing agents (such as CFC and pentane) and water vapor are extracted with nitrogen process gas. PU powder is separated from the material flow and directed to the matrix degassing unit. Coarse grain is then ready for Fe/NFe separation. Additional separation steps can be added to ensure highest output qualities.

In the matrix degassing unit, the PU undergoes thermal treatment through a multi-step heating and cooling process in a closed system. Final traces of CFC and pentane are removed via nitrogen gas, reducing residual blowing agents in the PU powder to below 0.1 wt.-%. The cleaned PU powder is then collected in a big-bag station or silo for further treatment or disposal. With additional separation step for the PU powder we can achieve highest purities.

Punch pliers and drill head

ADuro QZ for shredding

References in fridge recycling

CUSTOMER	PLANT	START UP
Triade Electronique, France	Complete recycling plant for refrigerators and cooling appliances / ADuro QZ-2500.	2023
Remondis Electrorecycling, Germany	Complete recycling plant for refrigeration appliances according to WEEELABEX standard. / ADuro QZ-2500	2021
EMP Recycling, Lithuania	Fully encapsulated, single-stage recycling system for the safe recovery of gases. / ADuro QZ-2000	2021

Customer benefits

- **High value recovery**
  Maximum recovery of metals and high-purity PU through advanced separation and degassing
- **Safe hazard management**
  Enclosed, monitored processing of CFCs, pentane, and cooling agents
- **Regulatory compliance**
  Meets the strictest environmental standards with ultra-low residual emissions
- **Efficient automated operation**
  Fully automated processes ensure reliable performance and low operating costs
- **Flexible system design**
  Modular, customizable solutions backed by proven ANDRITZ expertise and references

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