

Responsible Appliance Disposal (RAD) Program: Example Language for Procuring Refrigerated Appliance Recycling Services Using Best Environmental Practices



The purpose of this document is to provide current and prospective Responsible Appliance Disposal (RAD) partners with example language for procuring refrigerated appliance recycling services using best environmental practices. The following language is consistent with RAD partnership requirements, and can be inserted directly into new or existing procurement solicitation documents.

Example Scope of Work

Required

The CONTRACTOR shall implement best practices for the recycling/disposal of the collected refrigerated appliances, including:

Refrigerant

- Under Section 608 of the 1990 Clean Air Act Amendments and the implementing regulations at [40 Code of Federal Regulations \(CFR\) Part 82 Subpart F](#), no refrigerant may be vented during the disposal of appliances¹ (40 CFR § 82.154(a)); therefore, refrigerant must be recovered at equipment end-of-life (40 CFR § 82.155). In some instances, the intentional discharge of flammable refrigerants during appliance disposal may be subject to hazardous waste or other regulations.
- Refrigerant must be properly recovered using [EPA-certified refrigerant recovery equipment](#), meaning that at least 90% of the refrigerant must be recovered if the compressor is operating, and at least 80% must be recovered otherwise; alternatively, the refrigerant can be evacuated to four inches of mercury vacuum (40 CFR § 82.156(d)).
- Refrigerant must either be [reclaimed](#) by an [EPA-certified reclaimer](#) (see 40 CFR § 82.164) for reuse, or destroyed using approved destruction methods (see [40 CFR § 82\(a\)](#)) in accordance with applicable federal, state, and local environmental regulations.

Foam

- Insulating foam must be removed prior to the disposal of the appliance, either manually or by using an automated system. The insulating foam should then either be sent to a destruction facility, or processed using advanced technology to mechanically separate the liquid blowing agent for reclamation or destruction.
- Acceptable methods to remove the insulating foam include:
 - **Manual Foam Recovery**, where saws are used to cut through appliances and expose the foam insulation, which is then removed in pieces as large as possible by scraping or “filleting.” Once manually removed, appliance foam is bagged with the blowing agent intact and sent for destruction at a waste-to-energy incineration facility. This method is estimated to achieve a blowing agent recovery efficiency of 85%, meaning that only 15% of the blowing agent is released to the environment.
 - **Semi-Automated Foam Recovery**, where foam is manually recovered from an appliance, but is then processed using automated technologies to recover the blowing agent from the appliance foam. The automated technologies capture the foam-blowing agent under negative pressure and condense it into liquid form, which is bottled and sent off-site for reclamation or destruction. This method is estimated to achieve a blowing agent recovery efficiency of 85%, meaning that only 15% of the blowing agent is released to the environment.
 - **Fully Automated Foam Recovery and Processing**, which uses automated technologies that both recover and process appliance foam in one step. These technologies shred the whole appliance (with foam intact) in fully enclosed equipment following the removal of refrigerant, used oil, appliance doors, and interior glass and metal shelving. This process results in the highest blowing agent recovery efficiency— estimated at 95%, meaning that only 5% of the blowing agent is released to the environment.

¹See § 82.154 for exceptions.

Polychlorinated Biphenyls (PCBs)

PCBs must be properly managed in accordance with the federal Toxics Substances Control Act (TSCA) ([40 CFR § 761](#)).

- PCBs are most likely to be found in a capacitor. If the capacitor does not note that it does not contain PCBs or the capacitor (or refrigerator) was manufactured before 1979, assume that the capacitor contains PCBs (see 40 CFR § 761.2 (a) (4) for PCB concentration assumptions and 40 CFR § 761.3 for definitions).
- Storage of PCB capacitors, which are regulated for disposal, must be for no more than one year and must be in accordance with 40 CFR § 761.65.

Mercury

Mercury must be properly managed in accordance with federal hazardous waste regulations ([40 CFR § 273](#)).

- Mercury waste, such as switches and relays, must be recovered from appliances prior to disposal, sent to a qualified recovery facility that has appropriate hazardous waste management permits, and managed in accordance with applicable federal, state, and local hazardous waste regulations (e.g., waste must be properly packaged prior to transport) (40 CFR § 273).

Used oil

Used oil removed from appliances must be properly managed in accordance with the federal used oil management standards ([40 CFR § 279](#)), or the equivalent state regulations.

- Before recycling and disposal, used oil must be stored in appropriate containers in good condition and with no visible leaks (40 CFR § 279).
- Per the Resource Conservation and Recovery Act (RCRA) used oil requirements, refrigerant contaminating the used oil should be recovered. Used oil removed from refrigerated appliances cannot be mixed with used oil from other sources (40 CFR § 279).

Durable Materials

All recoverable durable materials including metal, plastic, and glass, should be recycled to the extent possible.

Reporting

In addition, the CONTRACTOR will provide any available data as requested by the [COMPANY] to assist in the preparation of the [COMPANY's] RAD Annual Reporting Form due to EPA by January 31 each year. This information may include:

- Type and quantity of refrigerant recovered and reclaimed or destroyed;
- Type and quantity of foam blowing agent recovered and reclaimed or destroyed;
- Number and age of appliances collected;
- Weight of metals, plastics, and glass recycled; and
- Quantity of hazardous waste products and used oil recovered or destroyed.

Optional

In addition to implementing best practices for the recycling/disposal of refrigerated appliances, current and prospective RAD partners may consider expanding the scope of work for solicitations to include other turnkey services such as appliance collection and transportation, customer service (e.g., pick-up scheduling and incentive/rebate management), and technical assistance to support completion of the partner's RAD Annual Reporting Form.

Where can I find more information?

For more information, visit the EPA's RAD program website at: <https://www.epa.gov/rad> or contact Sally Hamlin, the RAD Program Manager, at hamlin.sally@epa.gov.