**iPhone 14 Pro**

**iPhone 14 Pro Max**

# Apple Recycler Guide

June 2023

# Contents

# About This Guide

Apple Recycler Guides provide guidance for electronics recyclers on how to disassemble products to maximize recovery of resources. The guides provide step-by-step disassembly instructions and information on the material composition to help recyclers direct fractions to the appropriate material recycler.

To conserve important resources, we work to reduce the materials we use and aim to one day source only recycled or renewable materials in our products. A key path to reaching that goal is resource recovery from end-of-life electronics.

Disassembly procedures are intended to be performed only by trained electronics recycling professionals. The recycler is responsible for independently evaluating and ensuring compliance with all applicable environmental, health, and safety laws related to the work. These include but are not limited to laws relating to the management, handling, shipping, and disposal of the outputs of this work as waste and laws in place to ensure the health and safety of all employees who support this work.

For questions or feedback about this guide, email contactesci@apple.com.

**Note:** This guide may show images from other similar models, but the procedures are the same.

# Identification

Generally, you can find the model number for the iPhone inside the SIM tray slot.
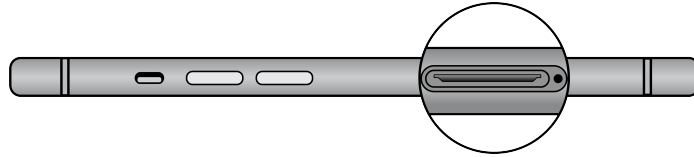


*Model numbers:*
*A2889, A2890, A2891, A2892, A2893, A2894, A2895, A2896*

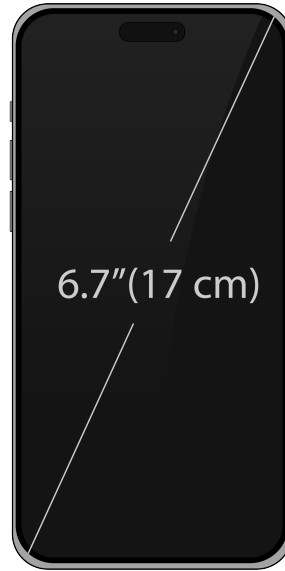For an iPhone without a SIM tray slot, use the diagonal measure to identify the model:

- iPhone 14 Pro (6.1 inch or 15.5 cm diagonal)
- iPhone 14 Pro Max (6.7 inch or 17 cm diagonal)

**iPhone 14 Pro**  **iPhone 14 Pro Max**



6.1"(15.5 cm)  6.7"(17 cm)

*Model number:*
*A2650*

*Model number:*
*A2651*

# Directive 2012/19/EU Annex VII Components

Directive 2012/19/EU Annex VII requirements apply to the following substances and components.

| Substance/Component | Apple Part Name | Removal Instructions |
| --- | --- | --- |
| Printed circuit board if the surface is greater than 10 square centimeters | Display logic board, main logic board | Follow steps 1–13 |
| External electric cables | Charge cable | Follow step 1 |
| Battery | Lithium-ion polymer battery | Follow steps 1–7 |
| Cover glass and organic light-emitting diode (OLED) display if the surface is greater than 100 square centimeters | OLED display | Follow steps 1–6 |
| No further substances or components as listed in Annex VII | | |

# Safety Considerations

The recycler is responsible for independently evaluating all activities undertaken by its employees to perform or support the work and ensuring compliance with all applicable health and safety laws related to the work. These include but are not limited to laws relating to the health and safety of all employees who perform or support this work. The recycler is also responsible for evaluating the workspace and ensuring that the area in which the work is to be undertaken is designed using ergonomic best practices and meets all ergonomic requirements to ensure the protection of its employees.

Broken OLEDs must be handled properly to ensure the safety of your employees and mitigate any hazards. Package broken OLEDs in an appropriate container to properly manage the hazards associated with the materials and store only with compatible materials. All waste must be properly classified, packaged, and labeled in accordance with all relevant laws and regulations.

## Personal Protective Equipment

Personal protective equipment should be worn during the entire recycling process.

 Wear hand protection

 Wear foot protection

 Wear eye protection

 Wear a mask

 Wear protective clothing

## Battery Safety

This product uses a lithium-ion polymer battery. Before beginning any disassembly work, ensure that a safe working procedure for handling lithium-ion batteries has been established, which could include discharging the batteries so that they can be more safely managed. The following considerations may also be included:

- Remove anything from your person that could conduct energy, such as jewelry and watches, to avoid electric shock to yourself or the logic board.
- To avoid the potential for thermal runaway and the release of potentially noxious fumes, don't puncture, strike, or crush lithium-ion polymer batteries or devices powered by them.
- Don't throw, drop, or bend the battery.
- Don't expose the battery to excessive heat or sunlight.
- Don't use tools that are sharp or conduct electricity.
- Keep your workspace clear of foreign objects and sharp materials.

- Dispose of batteries according to local environmental laws and guidelines.

### Workspace safety guidelines

- Use heat-resistant gloves and safety glasses.
- Keep a sand dispenser within arm's reach (2 feet or 0.6 m) on one side of the workstation, not above the workstation. The dispenser should be a wide-mouthed, quick-pour metal container with a flip-top lid or tray that contains 8–10 cups (1.9–2.4 L) of clean, dry, untreated sand.
- Keep the battery at least 2 feet (0.6 m) from paper and other combustible materials.
- Work in an area with adequate ventilation.

### Handling a thermal runaway

If you notice any of the following signs, a thermal runaway is likely underway, and you should act immediately:

- The lithium-ion polymer battery or a device containing one begins to smoke or emit sparks or soot.
- The battery pouch suddenly and quickly puffs out.
- You hear hissing or popping sounds.

**Don't** use water or an ABC/$CO_2$ fire extinguisher on a thermal runaway battery or a device containing one. Water and ABC/$CO_2$ fire extinguishers will not stop the reaction.

**Do** smother the battery or device immediately with plenty of clean, dry sand, dumped all at once. Timing is critical; the faster you pour all the sand, the faster the thermal runaway will stop.

**Do** leave the room for 30 minutes if the thermal runaway causes any irritation.

**Do** wait 30 minutes before touching the battery. Wear heat-resistant gloves and safety glasses to remove the battery from the sand, or use a touchless thermometer to measure the battery temperature. Only touch the battery when the event has finished.

**Do** dispose of the damaged battery or device (including any debris removed from the sand) according to local environmental laws and guidelines.

## OLED Safety

Broken OLEDs must be handled properly to ensure the safety of your employees and mitigate any hazards. Package broken OLEDs in an appropriate container to properly manage the hazards associated with the materials and store only with compatible materials. All waste must be properly classified, packaged, and labeled in accordance with all relevant laws and regulations.

## Hazard Warnings

| | | | | |
|---|---|---|---|---|
| ⚠️ | Broken glass hazard | | ⚠️ | Rechargeable battery hazard |
| ⚠️ | Chemical inhalation hazard | | | |

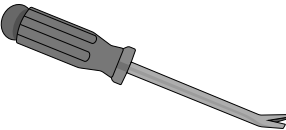# Recommended Tools

Flat-blade screwdriver
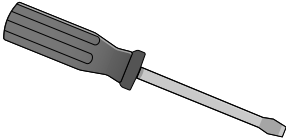
Miniature plastic pry bar
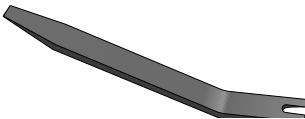
Miniature pry bar
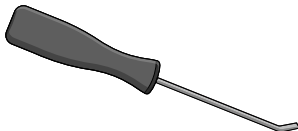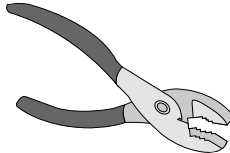
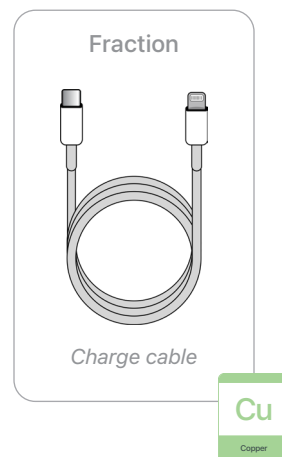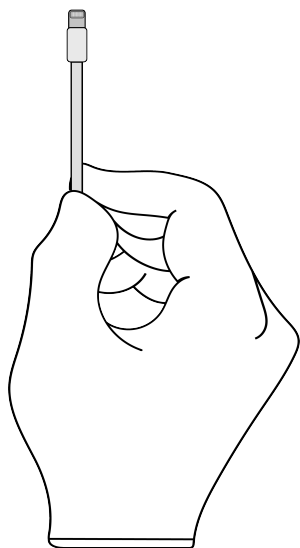Nail-pulling screwdriver

SIM-eject tool

Slip-joint pliers

Tweezers

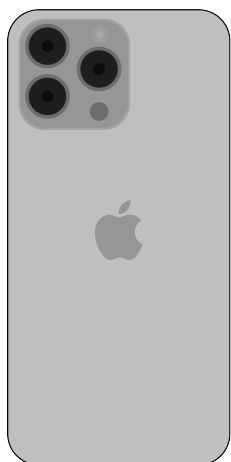# Disassembly Instructions

## 1. Remove the charge cable.

» *Ensure that the iPhone is turned off.*
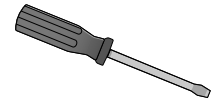
» *Disconnect the charge cable.*

Fraction

*Charge cable*

Cu
Copper

**2.** Remove the OLED display.

> ⚠️ Broken glass hazard

> ⚠️ Chemical inhalation hazard

» *Hold the iPhone at the edge of a counter with the display face up and the Lightning connector toward the counter edge.*

» *Insert the tool tip into the Lightning connector. Push the handle down to pry the display from the enclosure.*
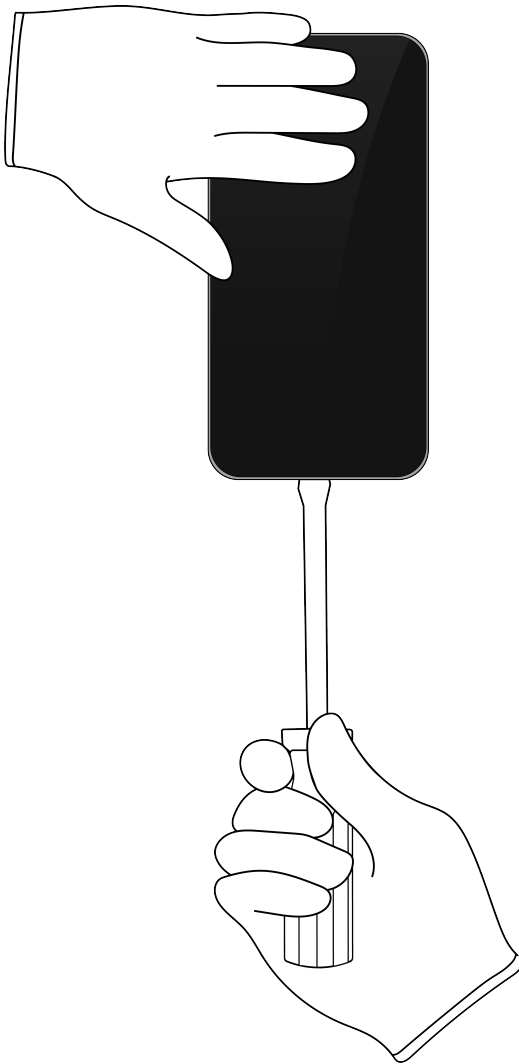
» *Remove the OLED display by hand. Set the enclosure aside.*
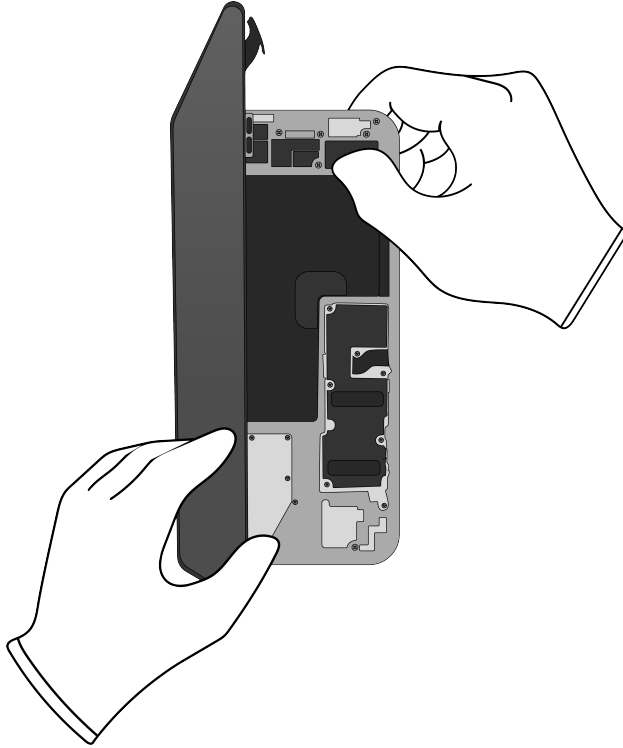
**3.** Separate the display frame from the OLED display.

» *With the display facedown, pry the display frame away from the OLED display.*

Tools Used
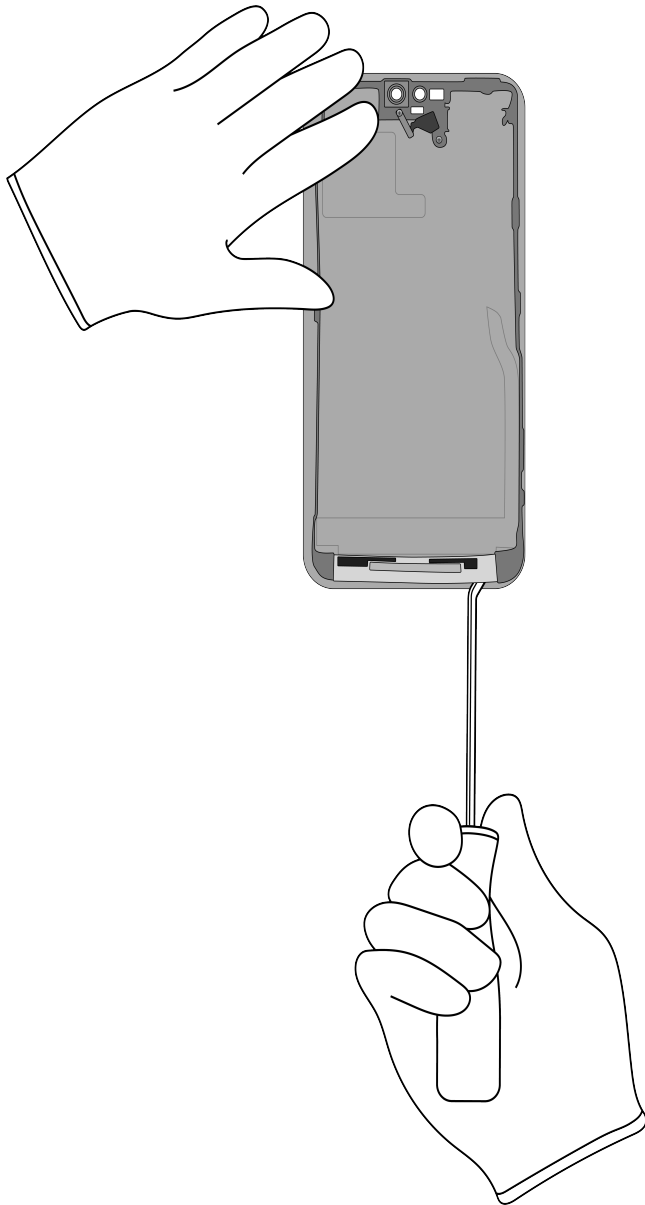
» *Pull off the display frame by hand. Set the OLED display aside.*

**4.** Remove the light sensor from the display frame.
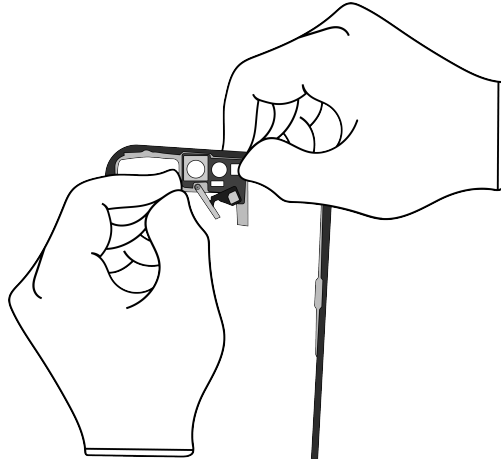


Fraction

*Light sensor*

Cu
Copper

Fraction

*Display frame*

Fe
Ferrous

**5.** Remove the display logic board from the OLED display.
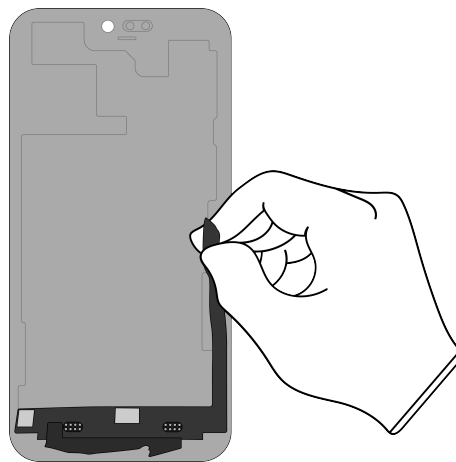


Fraction

*Display logic board*

PMs
Precious
Metals

**6.** Peel off the display backing.



Fraction



*Display backing*

**Fe**
Ferrous

Fraction



*OLED display*

**GL**
Glass
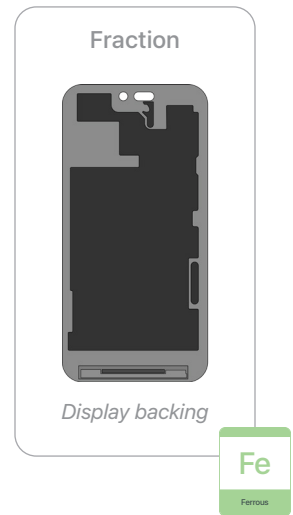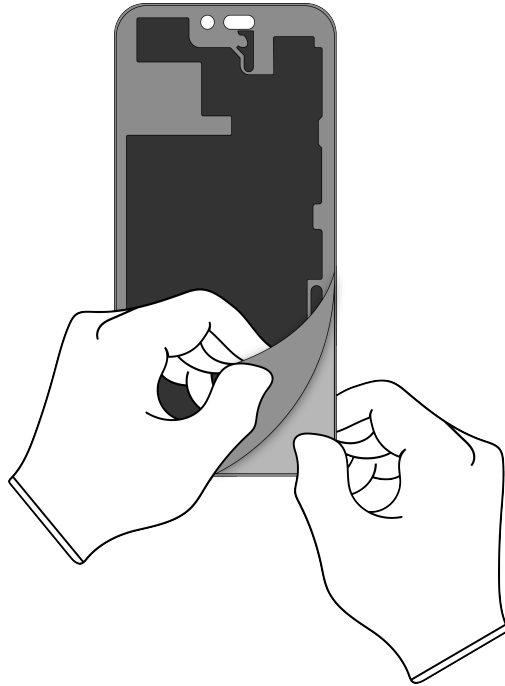
**7.** Inside the enclosure, carefully remove the lithium-ion polymer battery.

 Rechargeable battery hazard

» *Using tweezers, gently peel one of the black battery adhesive tabs away from the battery.*

» *Twist the tab around the tweezers until white adhesive appears. Continue twisting until the entire adhesive strip is removed.*

» *Repeat this process for any remaining battery tabs. Continue with the miniature plastic pry bar if needed.*
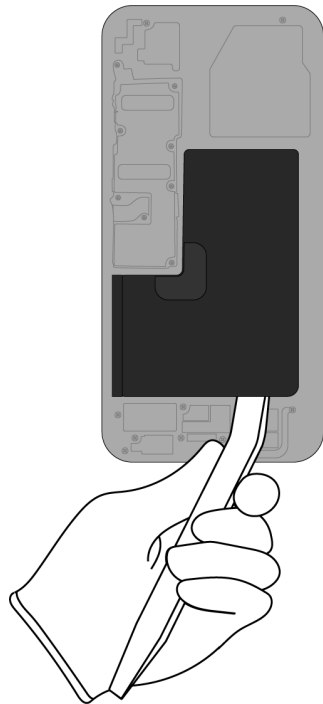
Tools Used



Fraction



*Lithium-ion polymer battery*

BT
Battery

**8.** (Models with a SIM tray slot) Remove the SIM tray.

» *Using the SIM-eject tool, remove the SIM tray.*
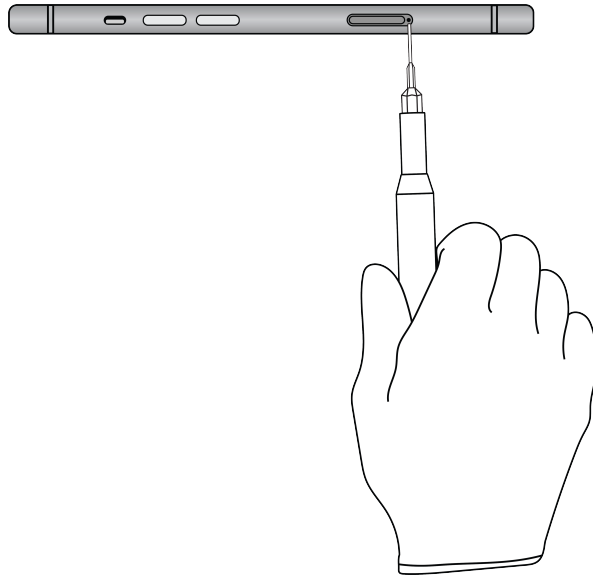
Tools Used



» *Separate the SIM card from the SIM tray.*
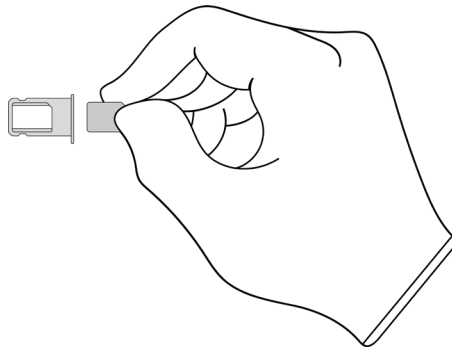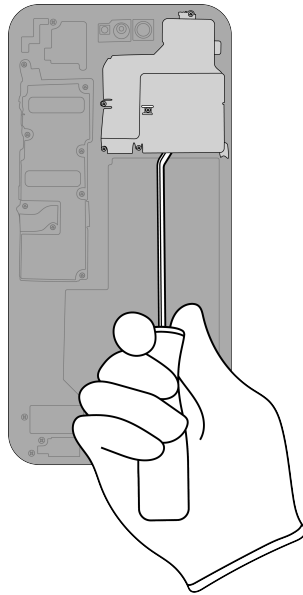


Fraction

*SIM card*
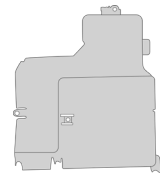
PMs
Precious
Metals
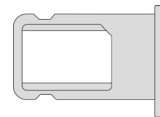
Fraction

*SIM tray*

Al
Aluminum

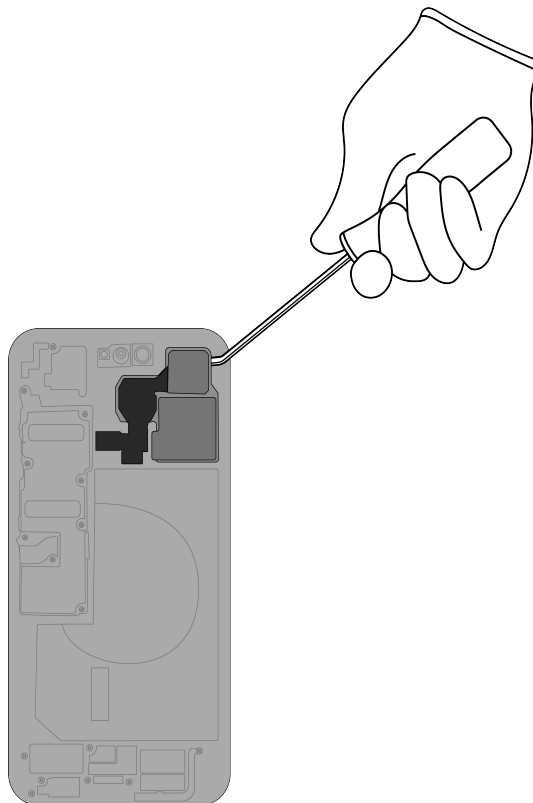**9.**  Pry off the camera cover.



Tools Used



Fraction



*Camera cover*

Fe

Ferrous

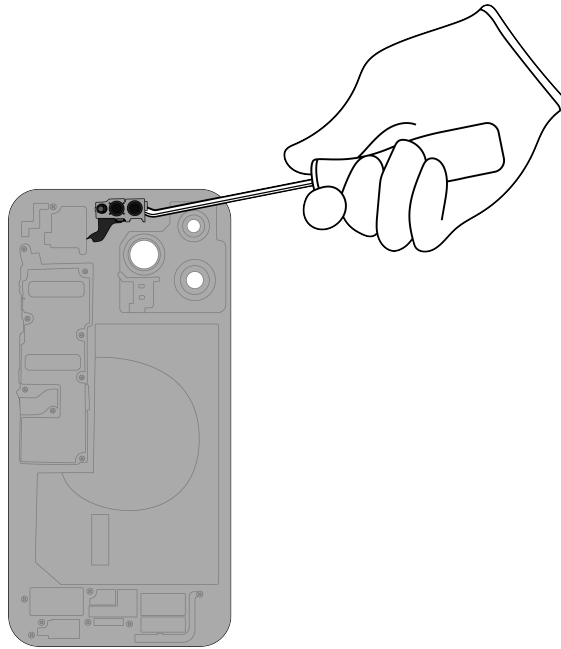**10.**  Pry off the rear camera.



Tools Used



Fraction



*Rear camera*

PMs

Precious
Metals
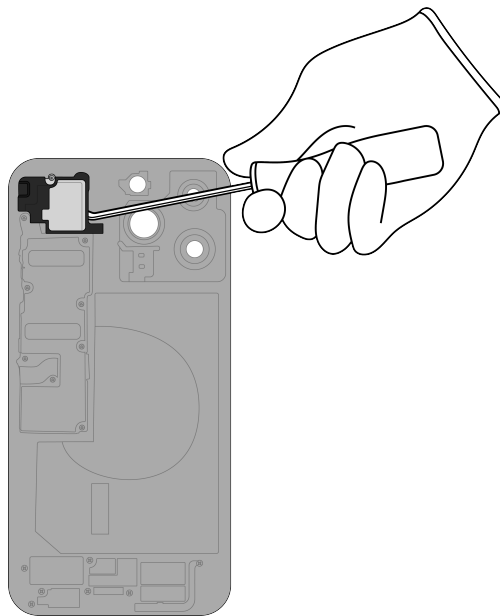
## 11. Pry off the front camera.



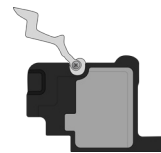### Tools Used



### Fraction



*Front camera*

**PMs**
Precious
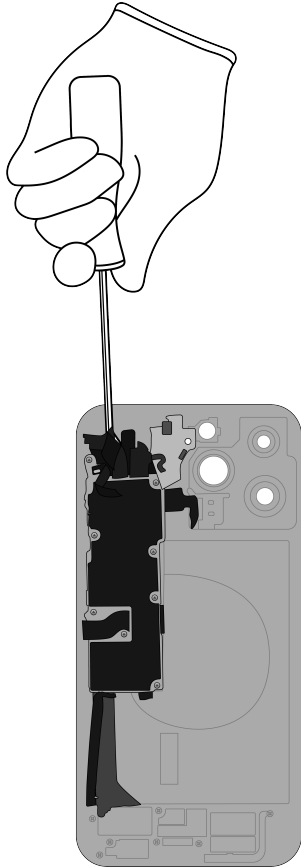Metals

## 12. Pry off the receiver.



### Tools Used



### Fraction



*Receiver*

**REE**
Rare Earth
Elements

## 13. Pry off the main logic board.



**Tools Used**



**Fraction**



*Main logic board*

**PMs**
Precious
Metals
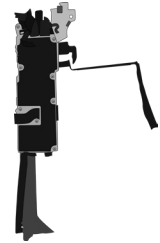
## 14. Pry off the LiDAR Scanner.
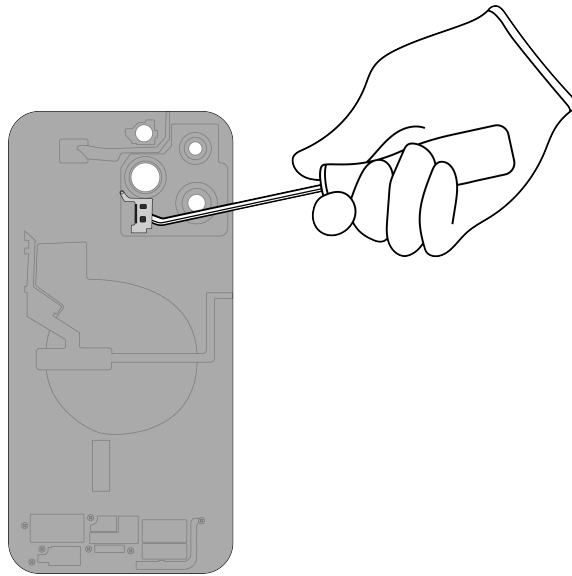


### Tools Used



### Fraction



*LiDAR Scanner*

**Cu**
Copper

## 15. Pry off the microphone.
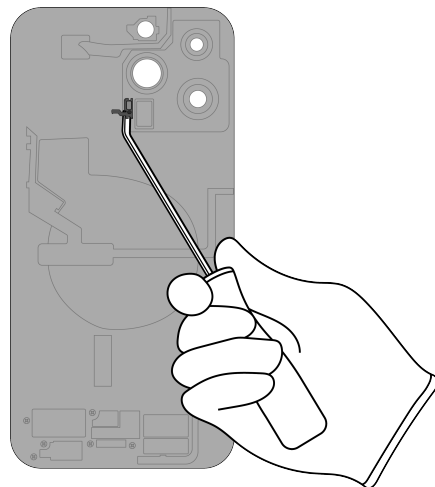


### Tools Used



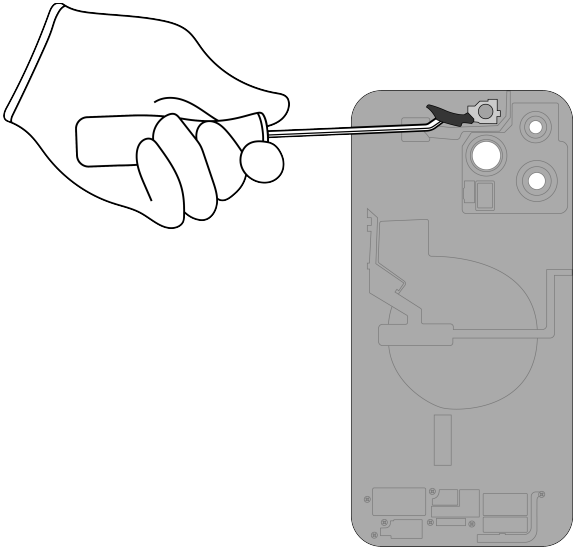### Fraction



*Microphone*

**Cu**
Copper

## 16. Pry off the strobe.



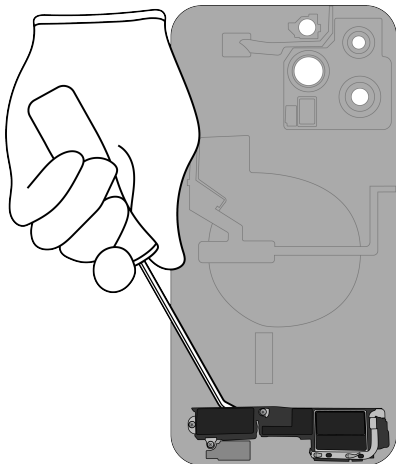**Tools Used**



**Fraction**



*Strobe*

Cu
Copper

## 17. Pry off the Taptic Engine and speaker.
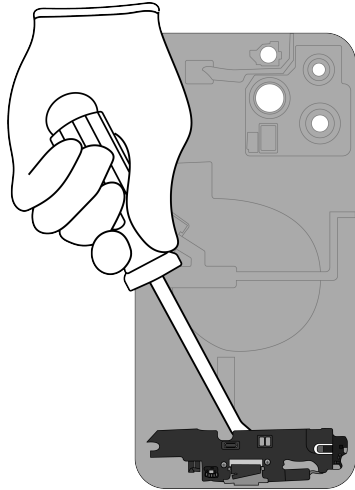


**Tools Used**



**Fraction**
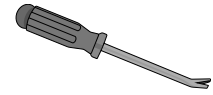


*Taptic Engine and speaker*

REE
Rare Earth Elements

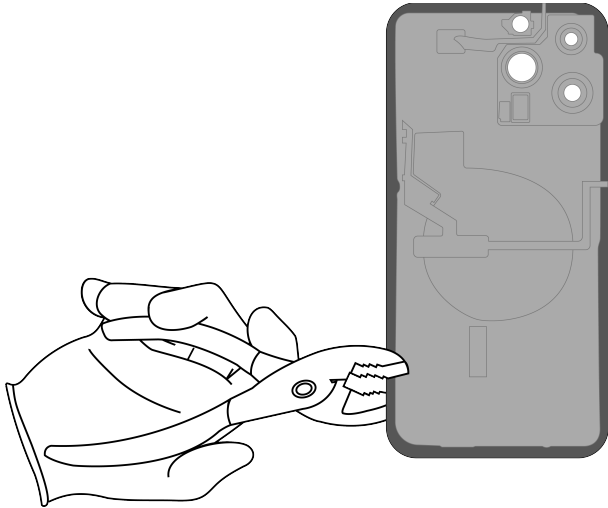**18.** Pry off the Lightning connector.

Tools Used

Fraction

*Lightning connector*

Cu
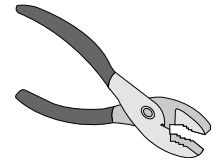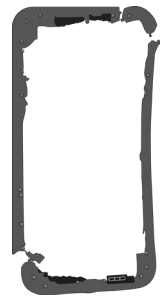Copper

**19.** Pull the enclosure band off the support plate.



Tools Used



Fraction



*Enclosure band*

Fe

Ferrous

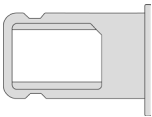Fraction



*Support plate*

Cu

Copper

# Material Categorization of Output Fractions

All outputs from this process must be managed, handled, and disposed of in accordance with applicable waste laws and regulations, including but not limited to the Waste Framework Directive and its national enactments in Europe.

| Fraction | Downstream Processing |
|---|---|
| **Aluminum** | **Primary Target Material** |
|  *SIM tray (except in models A2650, A2651)* | **Al** Aluminum |
| | **Potential Additional Materials** |
| | **Fe** Ferrous   **GL** Glass   **PL** Plastics |
| **Batteries** | **Primary Target Material** |
|  *Lithium-ion polymer battery* | **BT** Battery |

| Fraction | Downstream Processing |
|:---:|:---:|
| **Ferrous** | **Primary Target Material** |
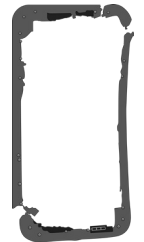


*Display frame*

**Fe**
Ferrous



*Display backing*

**Potential Additional Materials**

**PL**
Plastics



*Camera cover*



*Enclosure band*

| Fraction | Downstream Processing |
|:---:|:---:|

### Glass



*OLED display*

### Primary Target Material



GL
Glass

### Potential Additional Materials



| Cu | Fe | Au |
|:---:|:---:|:---:|
| Copper | Ferrous | Gold |

| ITO | PL |
|:---:|:---:|
| Indium Tin Oxide | Plastics |

---
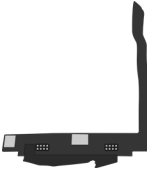
### Logic Boards



*Display logic board*



*SIM card
(except in models A2650, A2651)*



*Rear camera*

### Primary Target Material



PMs
Precious Metals

### Potential Additional Materials



| Al | Cu | Fe |
|:---:|:---:|:---:|
| Aluminum | Copper | Ferrous |

| GL | PL |
|:---:|:---:|
| Glass | Plastics |

---

| Fraction | Downstream Processing |
|---|---|
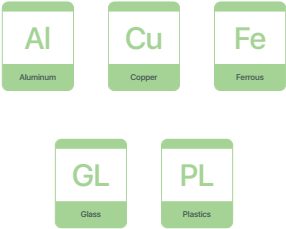
### Logic Boards (cont.)



*Front camera*



*Main logic board*

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### Mixed Electronics
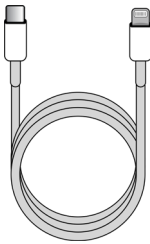


*Charge cable*



*Light sensor*

### Primary Target Material



Cu

Copper

### Potential Additional Materials



| Fe | GL | PL |
|---|---|---|
| Ferrous | Glass | Plastics |

PMs

Precious Metals

| Fraction | Downstream Processing |
| --- | --- |

### Mixed Electronics (cont.)



*LiDAR Scanner*
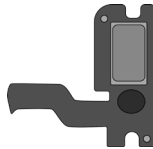


*Microphone*



*Strobe*



*Lightning connector*



*Support plate*

| Fraction | Downstream Processing |
|---|---|

### Rare Earth Magnets
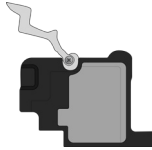


*Receiver*



*Taptic Engine and speaker*

### Primary Target Material

REE
Rare Earth Elements

### Potential Additional Materials

Cu
Copper

Fe
Ferrous

PL
Plastics

W
Tungsten