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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

You can find the model number on the back of the iPad Pro.

Model numbers:
(Wi-Fi) A2229
(Wi-Fi + Cellular) A2069, A2232, A2233
### Directive 2012/19/EU Annex VII Components

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

<table>
<thead>
<tr>
<th>Substance/Component</th>
<th>Apple Part Name</th>
<th>Removal Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printed circuit board if the surface is greater than 10 square centimeters</td>
<td>Display logic board, main logic board</td>
<td>Follow steps 1–17</td>
</tr>
<tr>
<td>External electric cables</td>
<td>Power adapter, charge cable</td>
<td>Follow step 1</td>
</tr>
<tr>
<td>Battery</td>
<td>Lithium-ion polymer battery</td>
<td>Follow steps 1–6</td>
</tr>
<tr>
<td>Cover glass and liquid crystal display (LCD) cell if the surface is greater than 100 square centimeters</td>
<td>LCD cell</td>
<td>Follow steps 1–5</td>
</tr>
<tr>
<td>No further substances or components as listed in Annex VII</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

Personal Protective Equipment

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

- Wear eye protection
- Wear protective clothing
- Wear hand protection
- Wear foot protection

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/CO₂ fire extinguisher on a thermal runaway battery or a device containing one. Water and ABC/CO₂ 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.

Hazard Warnings

- Broken glass hazard
- Rechargeable battery hazard
- Chemical exposure hazard
Recommended Tools

- Miniature pry bar
- Nail-pulling screwdriver
- Plastic pry bar
- Precision pick
- Screwdriver-handle pry bar
- Tweezers
Disassembly Instructions

1. Remove the power adapter and charge cable.
   
   » Ensure that the iPad Pro is turned off.
   
   » Unplug the power adapter. Disconnect both ends of the charge cable.
2. Remove the display.

- **Broken glass hazard**
- **Chemical exposure hazard**

» *Hold the iPad at the edge of a counter with the display facing up.*

» *Insert the tool tip into the bottom of the display. Push the handle down to pry the display from the enclosure.*

» *Remove the display by hand. Set the enclosure aside.*
3. Remove the display logic board.
   » Lay the display facedown.
   » Pry off the display logic board.

4. Pull off the ribbon cable.
5. Pull off the light sensors.
6. From the enclosure, carefully remove both lithium-ion polymer batteries.

⚠️ Rechargeable battery hazard

» For each battery, use tweezers to gently peel one of the 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 the remaining battery tabs. Continue with the plastic pry bar if needed.
7. Pry off the rear camera cover.

8. Pry off the lower rear camera.
9. Pry off the upper rear camera.

10. Pry off the LiDAR Scanner.
11. Pry off the strobe.

12. Pry off the upper right tweeter.
13. Pry off the front camera.

14. Pry off the upper left tweeter.
15. Pry off the upper left woofer.

16. Pry off the upper right woofer.
17. Pry off the main logic board.

18. Pry off the Apple Pencil magnetic connector.
19. Pry off the power supply logic board.

Tools Used
- Screwdriver

Fraction
- Power supply logic board

PMs
- Precious Metals
20. (Wi-Fi + Cellular models only) Remove the SIM card and SIM tray. Separate the SIM card from the SIM tray.
21. (Wi-Fi + Cellular models only) Pry off the SIM reader.

22. Pry off the lower left woofer.
23. Pry off the lower right woofer.

24. Pry off the lower left tweeter.
25. Pry off the lower right tweeter.

26. Pry off the connector cable.
27. Pry off the USB-C cover.

28. Pry off the Smart Connector.
29. Pry off the USB-C port.

30. Pull off the ribbon cables and wires.
31. Pry off the microphones.
32. Pry the ribbon cables off the side of the enclosure.

33. Pry off the Apple Pencil charging coil.
34. Pry the 108 magnets off the enclosure.
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.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Downstream Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>SIM tray</td>
<td>Primary Target Material</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Potential Additional Materials</td>
</tr>
<tr>
<td>Aluminum</td>
<td>AI</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Fe</td>
</tr>
<tr>
<td>Aluminum</td>
<td>PL</td>
</tr>
<tr>
<td>Batteries</td>
<td>Primary Target Material</td>
</tr>
<tr>
<td>Lithium-ion polymer batteries (x2)</td>
<td>BT</td>
</tr>
<tr>
<td>Fraction</td>
<td>Downstream Processing</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>Ferrous</strong></td>
<td><strong>Primary Target Material</strong></td>
</tr>
<tr>
<td><img src="image" alt="Rear camera cover" /></td>
<td>Fe (Ferrous)</td>
</tr>
<tr>
<td><img src="image" alt="USB-C cover" /></td>
<td>GL (Glass)</td>
</tr>
<tr>
<td><strong>Glass</strong></td>
<td><strong>Potential Additional Materials</strong></td>
</tr>
<tr>
<td><img src="image" alt="LCD cell" /></td>
<td>Fe (Ferrous), ITO (Indium Tin Oxide), PL (Plastics)</td>
</tr>
<tr>
<td>Fraction</td>
<td>Downstream Processing</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>Logic Boards</td>
<td></td>
</tr>
<tr>
<td>Display logic board</td>
<td></td>
</tr>
<tr>
<td>Lower rear camera</td>
<td></td>
</tr>
<tr>
<td>Upper rear camera</td>
<td></td>
</tr>
<tr>
<td>LIDAR Scanner</td>
<td></td>
</tr>
<tr>
<td>Front camera</td>
<td></td>
</tr>
<tr>
<td>Main logic board</td>
<td></td>
</tr>
</tbody>
</table>

**Primary Target Material**

- PMs

**Potential Additional Materials**

- Al (Aluminum)
- Cu (Copper)
- Fe (Ferrous)
- GL (Glass)
- PL (Plastics)
### Logic Boards (cont.)

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Downstream Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply logic board</td>
<td></td>
</tr>
<tr>
<td>SIM card</td>
<td></td>
</tr>
</tbody>
</table>

### Mixed Electronics

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Primary Target Material</th>
<th>Potential Additional Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power adapter</td>
<td>Cu</td>
<td>Fe, PL, PMs</td>
</tr>
<tr>
<td>Charge cable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ribbon cables and wires</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mixed Electronics (cont.)

- Light sensors
- Strobe
- Apple Pencil magnetic connector
- SIM reader
- Cable
- Smart Connector
<table>
<thead>
<tr>
<th>Fraction</th>
<th>Downstream Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mixed Electronics (cont.)</strong></td>
<td></td>
</tr>
<tr>
<td>USB-C port</td>
<td></td>
</tr>
<tr>
<td>Microphones</td>
<td></td>
</tr>
<tr>
<td>Apple Pencil charging coil</td>
<td></td>
</tr>
<tr>
<td><strong>Rare Earth Magnets</strong></td>
<td></td>
</tr>
<tr>
<td>Upper right tweeter</td>
<td></td>
</tr>
<tr>
<td>Upper left tweeter</td>
<td></td>
</tr>
<tr>
<td>Upper left woofer</td>
<td></td>
</tr>
<tr>
<td><strong>Primary Target Material</strong></td>
<td></td>
</tr>
<tr>
<td>REE</td>
<td></td>
</tr>
<tr>
<td><strong>Potential Additional Materials</strong></td>
<td></td>
</tr>
<tr>
<td>Cu</td>
<td></td>
</tr>
<tr>
<td>Fe</td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td></td>
</tr>
<tr>
<td>Fraction</td>
<td>Downstream Processing</td>
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<tr>
<td>----------</td>
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</tr>
</tbody>
</table>

**Rare Earth Magnets (cont.)**

- Upper right woofer
- Lower left woofer
- Lower right woofer
- Lower left tweeter
- Lower right tweeter

Magnets (x108)