



Mac Studio

Apple Recycler Guide

May 2023

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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.

Identification

You can find the model number on the bottom of the Mac.



Model number:
A2615

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	Power supply logic board, I/O board, main logic board	Follow steps 1–13
External electric cables	Power cord	Follow step 1
Battery	Coin cell battery	Follow steps 1–9
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.

Personal Protective Equipment

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



Wear hand protection



Wear protective clothing



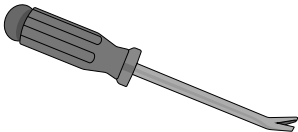
Wear eye protection



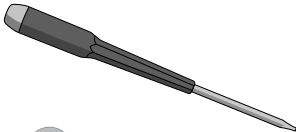
Wear foot protection

Recommended Tools

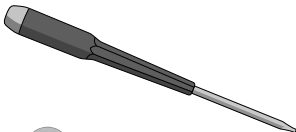
Nail-pulling screwdriver



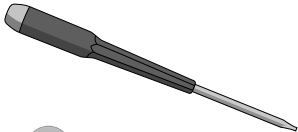
Torx T-3 screwdriver



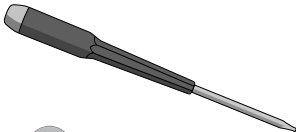
Torx T-5 screwdriver



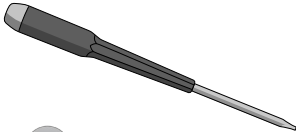
Torx T-6 screwdriver



Torx T-8 screwdriver



Torx T-10 screwdriver



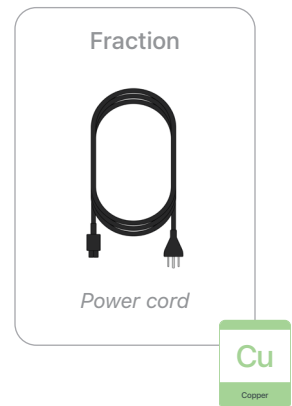
Disassembly Instructions

1. Remove the power cord.

» *Ensure that the Mac Studio is turned off.*

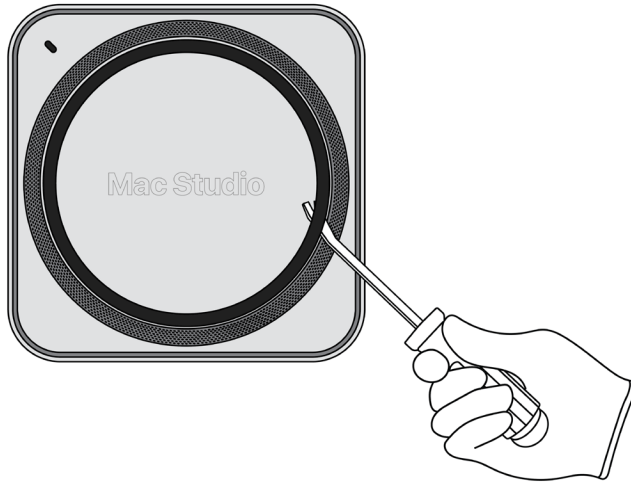


» *Unplug the power cord from the back of the computer.*

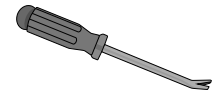


Warning: Before continuing disassembly, wait 10 minutes after unplugging the device for stored energy to discharge.

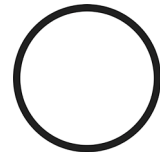
2. Pry the gasket off the bottom of the Mac Studio.



Tools Used



Fraction



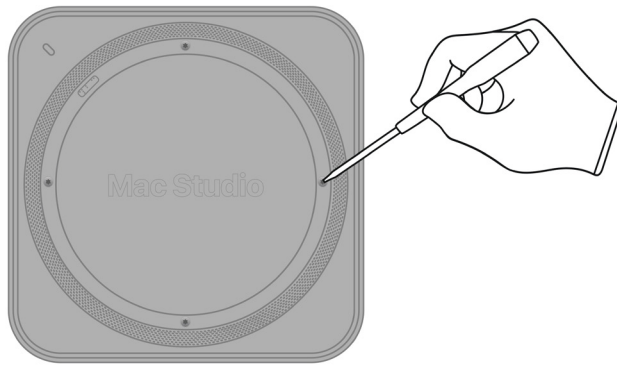
Gasket

PL

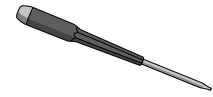
Plastics

3. Remove the bottom panel.

» Unscrew the four Torx T8 fasteners.



Tools Used



Fraction

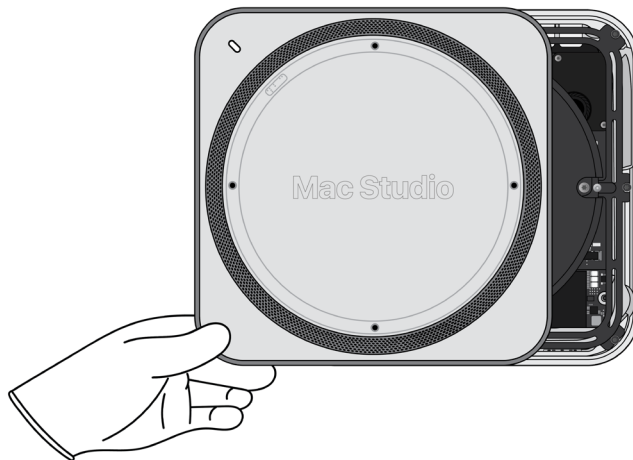


Fasteners (x4)

Fe

Ferrous

» Pull off the bottom panel.



Fraction



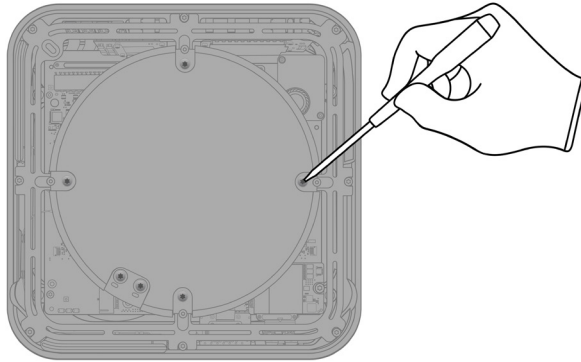
Bottom panel

Al

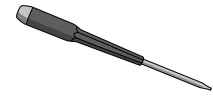
Aluminum

4. Remove the power supply logic board.

» Unscrew the six Torx T10 fasteners.



Tools Used



Fraction



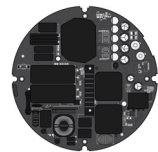
Fasteners (x6)

Fe

Ferrous

» Lift the power supply logic board out of the enclosure.

Fraction

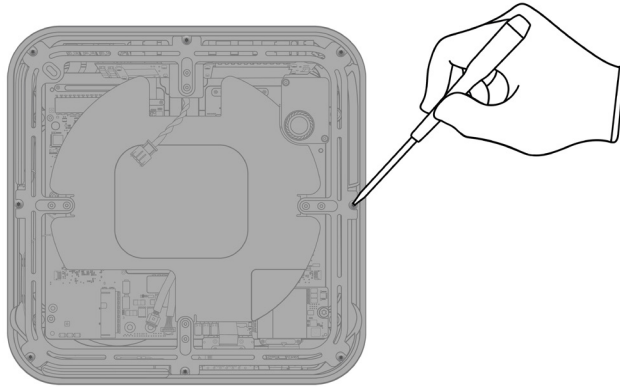


Power supply
logic board

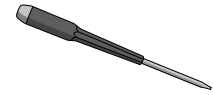
PMs

Precious
Metals

5. Remove the frame by unscrewing the eight Torx T6 fasteners from the enclosure. Set the enclosure aside.



Tools Used



Fraction

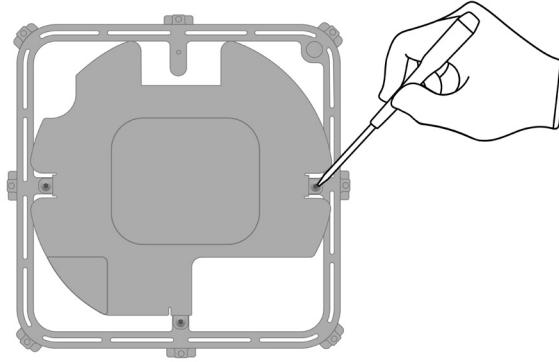


Fasteners (x8)

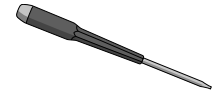
Fe

Ferrous

6. Remove the heat shield from the frame by unscrewing the three Torx T6 fasteners.



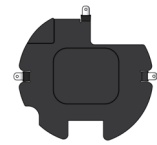
Tools Used



Fraction



Fasteners (x3)



Heat shield

Fe

Ferrous

Fraction



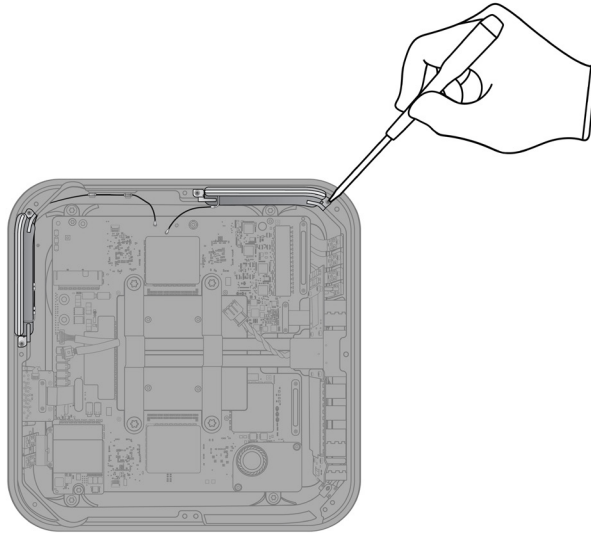
Frame

Al

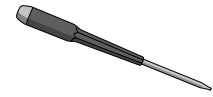
Aluminum

7. From the enclosure, remove the antennas.

» Unscrew the four Torx T5 fasteners from the antennas.



Tools Used



Fraction

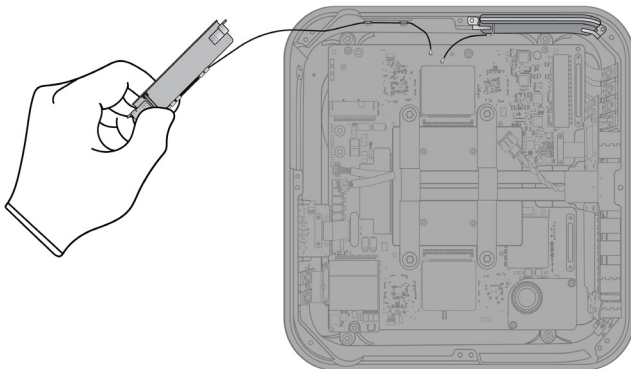


Fasteners (x4)

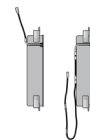
Fe

Ferrous

» Pull off both antennas by hand.



Fraction

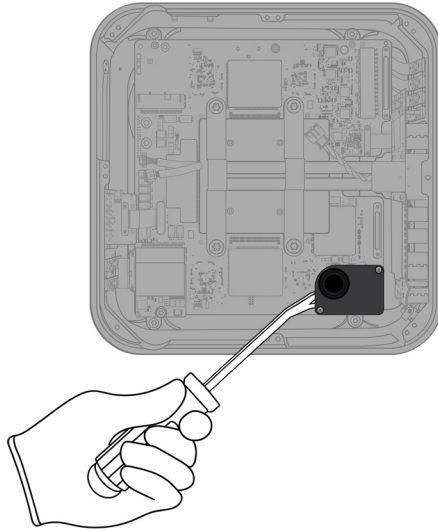


Antennas

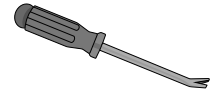
Cu

Copper

8. Pry off the speaker.



Tools Used



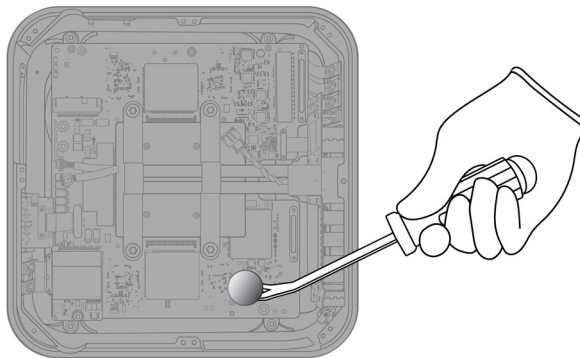
Fraction



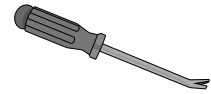
Speaker

REE
Rare Earth
Elements

9. Remove the coin cell battery.



Tools Used



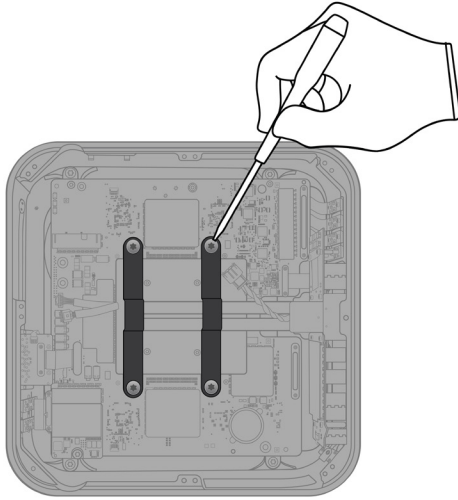
Fraction



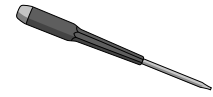
Coin cell battery

BT
Battery

- 10.** Remove the two brackets by unscrewing the four Torx T10 fasteners from the heat sink.



Tools Used



Fraction



Fasteners (x4)



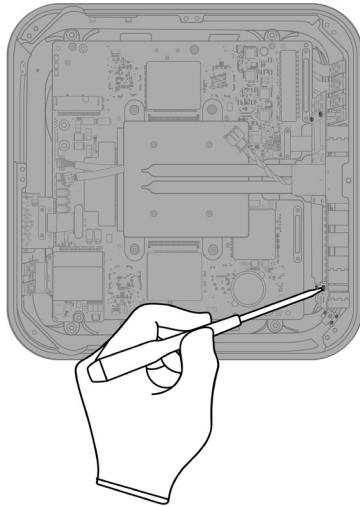
Brackets

Fe

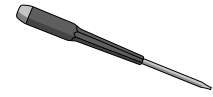
Ferrous

11. Remove the I/O board and the AC connector.

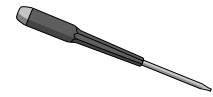
» Unscrew the seven Torx T3 fasteners from the I/O board.



Tools Used

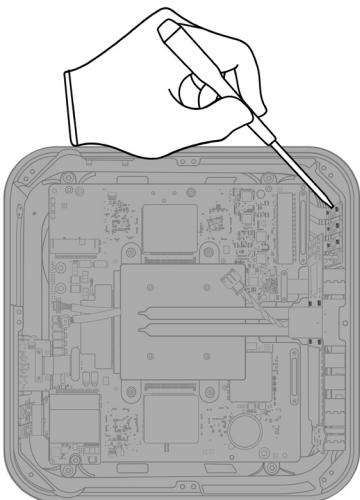


Torx T3



Torx T5

» Unscrew the 10 Torx T5 fasteners from the I/O board.



Fraction

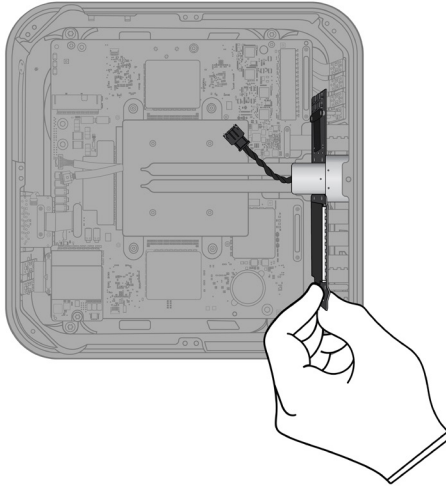


Fasteners (x17)


Fe

Ferrous

» Pull off the I/O board and the AC connector by hand.



Fraction




I/O board

PMs
Precious Metals

A diagram showing the I/O board and AC connector. The board is labeled "I/O board" and is associated with "PMs" (Precious Metals).

Fraction

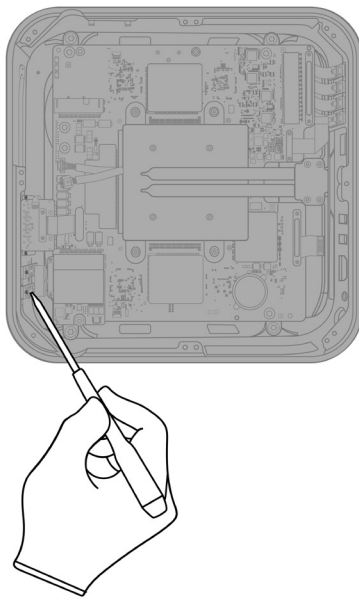


AC connector

Cu
Copper

A diagram showing the AC connector. It is labeled "AC connector" and is associated with "Cu" (Copper).


12. Unscrew the four Torx T5 fasteners from the SD card reader and Thunderbolt 3 ports.



Tools Used

A diagram showing a Torx T5 screwdriver.

Fraction



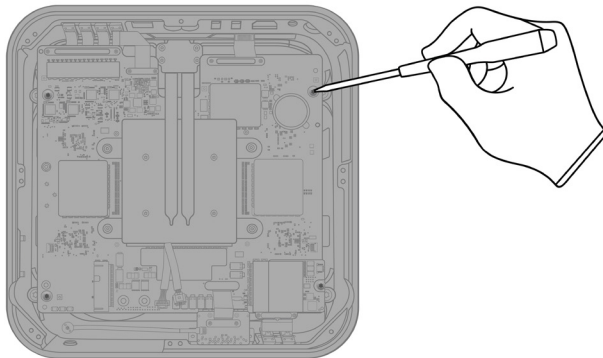
Fasteners (x4)

Fe
Ferrous

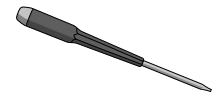
A diagram showing a Torx T5 fastener. It is labeled "Fasteners (x4)" and is associated with "Fe" (Ferrous).

13. Remove the main logic board.

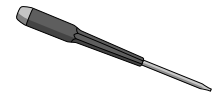
- » *Unscrew the four Torx T8 fasteners from the main logic board.*



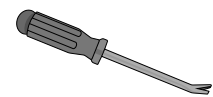
Tools Used



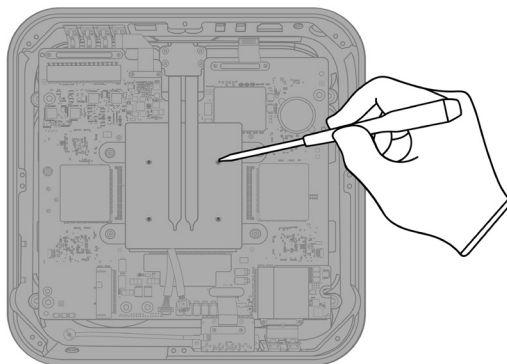
Torx T8



Torx T6



- » *Unscrew the four Torx T6 fasteners from the heat sink.*



Fraction

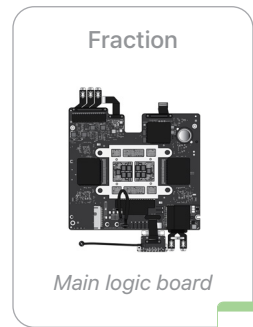
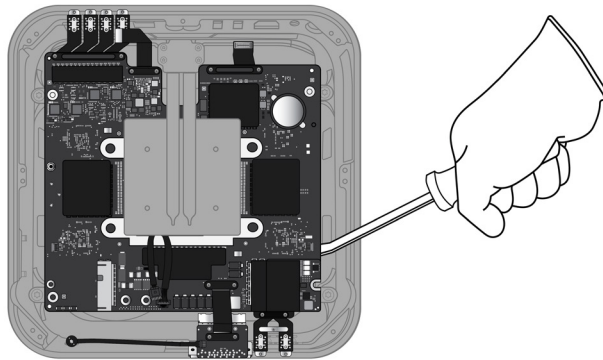


Fasteners (x8)

Fe

Ferrous

» Using the nail-pulling screwdriver, pry off the main logic board.

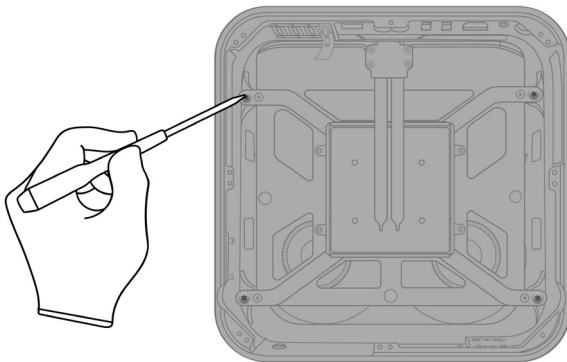


Fraction

Main logic board



14. Unscrew the four additional Torx T8 fasteners from the heat sink.



Tools Used

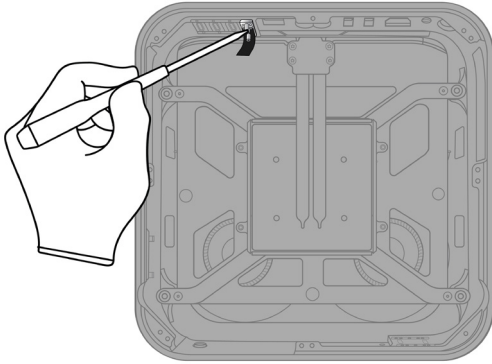


Fraction

Fasteners (x4)



- 15.** Remove the Thunderbolt 3 port by unscrewing the two Torx T5 fasteners.



Tools Used



Fraction



Fasteners (x2)

Fe

Ferrous

Fraction

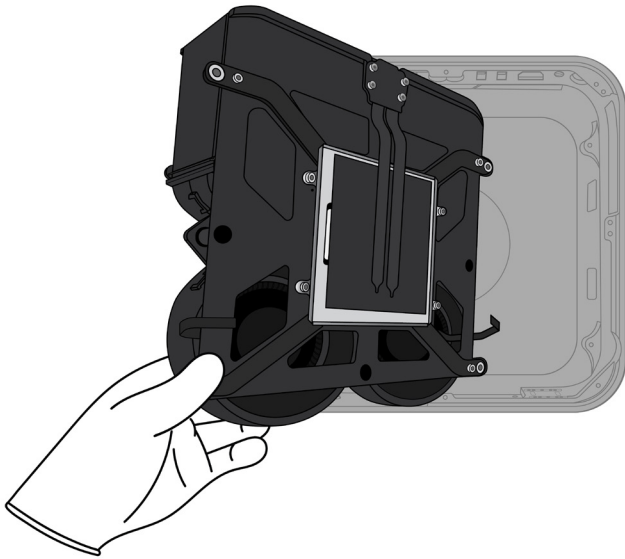


Thunderbolt 3 port

Cu

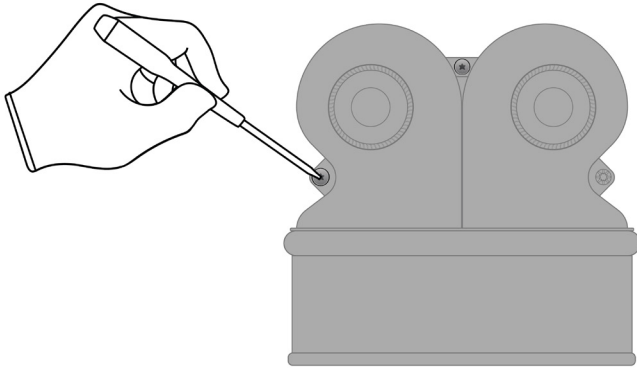
Copper

16. Pull the heat sink and dual fan out of the enclosure.

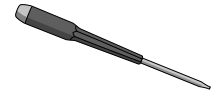


17. Separate the dual fan from the heat sink.

» Unscrew the two Torx T8 fasteners from the dual fan.



Tools Used



Fraction

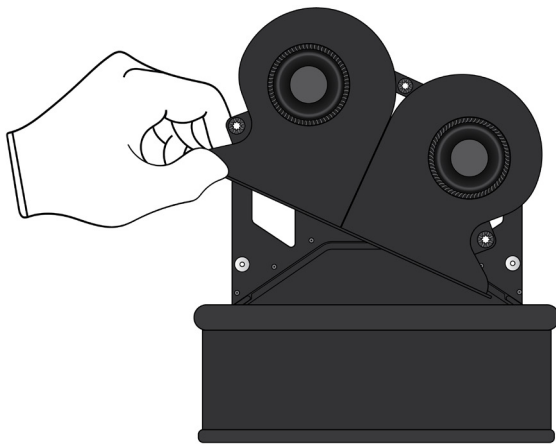


Fasteners (x2)

Fe

Ferrous

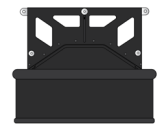
» Lift the dual fan off the heat sink.



Fraction



Dual fan









Heat sink



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
<p data-bbox="435 604 570 632">Aluminum</p>  <p data-bbox="435 842 566 863"><i>Bottom panel</i></p>  <p data-bbox="467 1079 534 1100"><i>Frame</i></p>  <p data-bbox="451 1316 552 1337"><i>Enclosure</i></p>	<p data-bbox="964 604 1276 632">Primary Target Material</p>  <p data-bbox="925 833 1315 861">Potential Additional Materials</p>  

<p data-bbox="440 1430 565 1457">Batteries</p>  <p data-bbox="422 1600 581 1621"><i>Coin cell battery</i></p>	<p data-bbox="964 1430 1276 1457">Primary Target Material</p> 
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Fraction

Downstream Processing

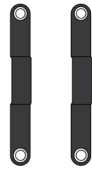
Ferrous



Fasteners (x66)



Heat shield



Brackets

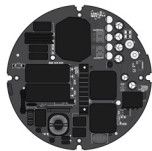
Primary Target Material



Potential Additional Materials



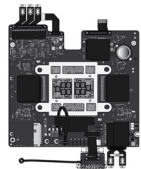
Logic Boards



Power supply logic board



I/O board



Main logic board

Primary Target Material



Potential Additional Materials



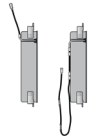
Fraction

Downstream Processing

Mixed Electronics



Power cord



Antennas



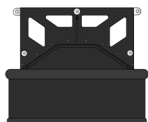
AC connector



Thunderbolt 3 port



Dual fan



Heat sink

Primary Target Material



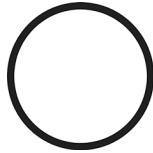
Potential Additional Materials



Fraction

Downstream Processing

Mixed Plastics



Gasket

Primary Target Material



Rare Earth Magnets



Speaker

Primary Target Material



Potential Additional Materials

