



Cisco UCS Series Servers Recyclability Report

UCS B480 M5

1. ASSUMPTIONS, METHODOLOGY AND CALCULATION

To complete the recyclability assessment on UCS series servers, Cisco engineering selected two server systems for the recyclability assessment. These systems were prototype units, previous used for Energy Star testing, and their design and construction are identical to the released version. Cisco compliance lab disassembled the units according to the input on the optimal disassemble procedure provided by business unit engineering and Cisco's US-based tier-1 recycler. Then the units were evaluated for design for longevity and design for end-of-life. Cisco then coordinate with the Electronic Manufacturing Service and Original Equipment Manufacturing partners to collect the physical weight and the material content data for the key components and all assemblies in order to reconcile with the lab data. Cisco then worked with our recycler and their industry peers to identify the industry best practice for initial and secondary operation. The best practice data from primary and secondary recycling operator on material processing is then used in the final calculation of product recyclability rate using the IEC/TR 62635 standard.

2. RECYCLING TECHNOLOGY

To calculate the product level recyclability rate, Cisco lab started with prototype units that were designed as typical untreated waste equipment. The first step is to remove all components and parts that are designated to be re-usable. Then the remains are disassembled to the single materials and/or fractions per industry's standards. During the disassemble process, photos were taken to document and validate the proper material coding per ISO 11469 standard. The fraction yields are grouped into the following category of fractions:

- Metal, Steel – metal enclosure, metal brackets, screws/nuts/stand-off, other metallic parts
- Metal, Aluminum – heat sinks
- Plastics – air deflector, cable hold-down, bezel
- High-grade Breakage – PCBA, add-on cards, fan
- Low-grade Breakage - Cables
- Reusable components – power supplies, CPU, memory, battery backup unit, add-on cards
- Special Treatment components – Lithium battery

The remaining hard to process material are then first processed for mechanical separation into similar material types and then sent for smelter.

3. RESULTS

With the information on the industry's best practice collected from Cisco's circular economy supply chain, our lab has identified the parts which are to be reused, require special treatment, or those can be optimized for material recovery and recycling based on a list of treatment methods from our partners.

Cisco's UCS Series of Enterprise Servers were designed in a way to optimize the upgradeability, reusability and recyclability. All components require special treatment are easily identifiable and they can be separated from the system by hand or with common tool. Lithium batteries are handled in a way to prevent short circuit. Hard disk drives, when they are beyond reuse and repair, are being evaluated for possible critical material recovery. With the support from Cisco circular economy supply chain, Cisco is able to divert most field replaceable units in good conditions such as the server hard disks, memory modules, fan modules, processors, super-capacitor-based battery backup unit, power supplies and add-on special function cards for refurbish and reuse. With the information on



material mass and material content collected from our engineering drawing and augment with data from our manufacturing and recycling partners, the following result is derived: