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ELECTRONICS & GADGETS CATALOGUE

Child Labour in Everyday Tech

2026









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Child Labour in the Mineral Supply Chains of Small electronics & gadgets

Have you ever wondered what minerals are inside the electronics you use every day?
Your smartphone, laptop, gaming console or headphones?
And did you know that these are possibly made with child labour?



The supply chains of our Gadgets

Every smartphone, laptop, gaming console and pair of headphones begins its life not on an assembly line but, in large part, at a mine. Every gadget you own ships with a spec sheet listing exactly what's inside it, except for the one spec that is rarely mentioned: *where the minerals came from, and who dug them out of the ground.* This report is that missing spec sheet. It traces the minerals and materials[a] behind the tech industry and documents the risk of child labour at that first, most invisible link in the chain: mining.

Child Labour in Mining

Child labour is work that deprives children of their childhood, their potential and their dignity, and that harms their physical and mental development. It refers to work that is mentally, physically, socially, or morally dangerous and harmful to children; and/or interferes with their schooling by depriving them of the opportunity to attend school, obliging them to leave school prematurely, or requiring them to attempt to combine school attendance with excessively long and heavy work [1]. It takes two main forms: 1. work below the minimum age; and 2. worst forms of child labour.

Child labour in mining is treated by the International Labour Organization as hazardous work, one of the worst forms of child labour under Article 3(d) of Convention No. 182 (1999). Forced labour and debt bondage are also documented in this sector [2]. Documented hazards include underground work, carrying heavy loads, working with dangerous tools and toxic substances such as mercury and cyanide to process the minerals [3]. Children have been involved in serious mining accidents, poisoned by exposure to toxic substances, and been victims of sexual abuse and economic exploitation, most often in the context of artisanal and small-scale (ASM) mining.

Why it's important to focus on this

An ILO estimate published in 2005 put the number of children in small-scale mining and quarrying worldwide at approximately 1 million [4]. This sits within a far larger picture: the ILO and UNICEF estimate that 138 million children were in child labour worldwide in 2024, with 54 million of them in hazardous work, with industry (including mining, manufacturing and construction) accounting for roughly 13% of all child labour globally [5]. Evidence from research studies shows that mining is by far the most hazardous sector for children with respect to fatal injuries. Studies report around double the rate of fatal injuries for children in mining than in agriculture or construction: an average of 32 per 100,000 full-time worker equivalents for children aged 5–17, against 16.8 and 15 respectively [6, 7]. Although child labour globally is slowly decreasing, the rising demand for minerals linked to the energy transition and digital technologies [8] may increase pressure on mining sectors and, in turn, increase the child labour risks in the mining sector [9].

Why it's hard to track

Precise prevalence is difficult to establish. A documented risk of child labour does not prove occurrence at every site, yet child-labour figures are widely considered to be underreported. Three structural features increase the risk of child labour in mining [10]:

- **Scale:**
  Artisanal and small-scale mining (ASM) is the mining practice most frequently linked to the worst forms of child labour, and is simultaneously a major global employer: at least 44.75 million people work directly in ASM across more than 80 countries [11].
- **Chain lenght:**
  Critical minerals move through a long, multi-step global supply chain - extraction, export, import, processing; risk of child labour is concentrated at extraction, but traceability becomes more difficult with each stage.
- **Market pressure:**
  Chronic lack of transparency, combined with high demand, fosters industry conditions (e.g. unrealistic turnaround times, unpredictable order volumes) that can elevate child-labour risk.[b]

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[a] Note: "Minerals" or "materials" here follows policy usage (raw materials and the metals derived from them), not strict mineralogical classification. Some of the "minerals" in this report are more accurately called metals or elements, as they are refined from a specific ore mineral. Several entries are byproducts or manufactured materials, not something dug out of the ground directly (e.g. Indium). Nonetheless, the report pays attention to the same issue: child labour and how children are affected in the extraction phase of the materials the tech world depends on.
[b] This report identifies child-labour risks associated with minerals used in the described product categories. It does not establish that any particular product or company's supply chain actually involves child labour.

Transparency issues in Tech Supply Chains

Each component of a phone or laptop has its own chains of mining, processing and manufacturing, often across several countries. Limited transparency in supply chains makes it difficult for manufacturers, regulators and consumers to see where the minerals in a device were extracted. This matters because untraced child labour is hard to stop, and because risk at the mining stage can reach companies further along the chain, exposing them to policy violations and reputational damage even if they never deal with a mine directly. International human rights frameworks[c] like the UN Guiding Principles on Business and Human Rights and the OECD Due Diligence Guidance for Responsible Business Conduct emphasize that companies should take active steps throughout their operations and supply chains to safeguard children, communities, and the environment. [12, 13]

Measuring the elemental composition of a device is possible, though laborious and costly [14, 15]. Tracing where those elements came from is harder, because their source may lie many layers deep in a supply chain. Proposed approaches include following the money rather than the ore, and certifying mines themselves.

Moreover, it is important to understand where electronics supply chains are vulnerable to child labour. During smelting, refining and alloy production, ore from child-labour-intensive ASM sites can be mixed with ore from industrial mines at regional trading hubs, after which the origin of a batch becomes difficult to assess. Certifications don't always cover these stages: in India's mica supply chain, it was flagged that social audits begin at the processing stage, after this mixing, when evidence of child labour is harder to find [16]. Child labour is also prevalent in informal e-waste recycling, showing that the whole lifecycle of electronics needs attention. Understanding and tackling the root causes of child labour is also needed to help prevent new vulnerabilities from arising.

With this report, TdH NL aims to raise awareness about child labour in the supply chain of commonly used electronics. We do not seek to name or blame companies, as we understand that awareness may be low and that tracing this is difficult. Instead, we would like to invite companies to engage in dialogue and collaborate with us and other stakeholders to better understand these risks, identify opportunities for improvement, and work towards more responsible and child-labour-free supply chains.

Which minerals? The elements which make up our gadgets

This report covers minerals with documented child-labour or flagged child-labour risks that are found in smartphones, laptops, gaming consoles or headphones. Data in this report draws on publicly available evidence: academic papers [9], tools and reports developed as a result of industry collaborations for sustainable sourcing [17], global datasets such as the U.S. Department of Labor's list of goods [18], and the EU's list of conflict-affected and high-risk areas (CAHRAs) for tin, tantalum, tungsten and gold under Regulation (EU) 2017/821 [19], and investigative NGO reporting [20, 21]. This report distinguishes between "documented" child labour and "risks" of child labour based on the amount of evidence per case: if sources report cases of child labour, this is deemed as "documented", while if the sources mention risks or conditions which might exacerbate the risk of child labour, this is described as a region with flagged "risk" of child labour. A "risk region" designation does not by itself establish child labour in the extraction of a specific mineral. Mention of a mineral in this report means we should pay extra attention to the way it's sourced, yet it does not mean that there have not been any efforts and successes in reducing child labour. Missing information and lack of recent data may reflect underreporting, lack of longitudinal studies in vulnerable regions, and absent public information about project outcomes.

Minerals named under this report include cobalt, lithium, manganese, natural graphite, copper, nickel, tantalum, tin, tungsten, gold, zinc, aluminium, chromium, mica, indium, silver and the rare-earth minerals; and nearly every one of them shows up, in gram or milligram quantities, inside smartphones, laptops and computers, gaming consoles, and headphones. A small share of a mineral in a device's weight does not by itself indicate low risk: due-diligence frameworks do not judge risk by quantity. The OECD Guidelines [13, 22] and the UN Guiding Principles [12] prioritise by the severity and likelihood of harm to people, with severe, hard-to-remedy impacts such as the worst forms of child labour coming first. Child labour can be considered a salient risk, meaning that it involves human rights at risk of the most severe negative impact and it should be taken seriously no matter the amount [23].

Which regions? The places the label doesn't mention

The affected regions identified in this review are: The Democratic Republic of Congo (DRC), Zambia, Zimbabwe, Nigeria, Bolivia, Indonesia, Peru, Philippines, India, Madagascar, Mozambique, Myanmar, Albania, Ghana, Tanzania, Burkina Faso, Mali, Cameroon, Venezuela, Uganda, Niger, Central African Republic, Colombia, Ecuador, Ethiopia, Guinea, Kenya, Mongolia, Nicaragua, Senegal, Sudan, Suriname. For some regions, classification reflects risk factors rather than confirmed cases of child labour in extraction: Uzbekistan, Brazil, Mexico, South Africa, Chile, Turkey. Child labour is e-waste recycling is also mentioned in Ghana, India, China, Thailand, Bangladesh, Indonesia. [1] [CR2] A region's absence from this list doesn't necessarily reflect an absence of risk, rather it may reflect gaps in available evidence

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Child labour tends to cluster where similar conditions coincide: widespread poverty, prevalent ASM, weak legislation and enforcement, a lack of alternative livelihoods for families, and socio-cultural norms that discourage outside intervention [24]. Its root causes are diverse, overlapping and mutually reinforcing, so a single measure or company policy is unlikely to resolve them alone.



Which products? Child labour risks across four product categories

Strip away the branding, the features or the price tier, and the product categories covered in this report have one feature in common: risk of containing minerals whose extraction has involved child labour. Smartphones, laptops, gaming consoles and headphones are the focus of this report because consumer electronics account for a notable share of global consumption of several of these minerals (e.g. ICT products use 15% of global tantalum) [25], and because these are everyday use products. Moreover, many of these products are often used by children, creating a paradox: children are using tech that was produced with child labour.

The chapters that follow take each product apart, mineral by mineral, to set out what is known about child-labour risk in its supply chains.

[c] In the EU, other relevant policies are the EU CSDDD [83] and the EU Batteries Regulation [84].

Smartphones



Small devices such as smartphones contain small amounts of dozens of minerals [26], which may tempt companies to lose oversight of the risks associated with mining them. Smartphones can contain around 45% metals[d], 32% glass, 17% plastics and 6% other materials by weight [27]. Metals present in highest quantity (>1g) are (in no particular order) iron, silicon, magnesium, aluminium, copper, nickel, chromium, followed by 0.1-1g for tin, zinc, strontium, barium, tungsten, neodymium, manganese, titanium. However, as stated in the introduction, it is not the quantity of minerals that is relevant and rather the salient risk that should be considered. Several of the minerals behind these elements, including cobalt, tin, tantalum, tungsten and gold, appear on lists of goods produced with child labour [18].

Below is a non-exhaustive overview of the minerals (and their quantities)[e] found in smartphones which have documented cases or risks of child labour, the components that contain them, and the geographies of concern.



Child Labour Risk Minerals found in Smartphones

Battery minerals.
Cobalt (~5–10g per product), the cathode material in lithium-ion batteries, remains the sector's best-documented [28, 29] case of child labour: in the Democratic Republic of Congo's (DRC) Lualaba and Haut-Katanga provinces, children as young as seven dig, wash and carry ore in artisanal pits [20], hauling bags weighing as much as they do, while toxic tailings contaminate water and crops for surrounding communities, also risking adverse health effects (respiratory diseases and birth defects) [30]. Cobalt is a by-product, usually found alongside copper and nickel. Extracting it relies on two very different methods: industrial open-pit and artisanal mines. According to UNICEF, more than 40.000 children were working in hazardous conditions in mines of southern DRC in 2014, with a majority in the cobalt sector [31]. Artisanal mining in DRC cobalt production decreased considerably between the late 2010s and 2024 [32]. Nevertheless, thousands of children are likely to still work in dangerous conditions, and many more are affected by the environmental impact of cobalt mining. Although 75% of the world's cobalt is extracted in DRC [33], there may also be a risk of child labour in cobalt mining in Madagascar, Zimbabwe, Brazil & Mexico, South Africa and Turkey [34]. The hard, shiny grey metal cobalt is crucial for the batteries that keep our smartphones pinging. This is because it stabilizes the lithium-ion, essentially maximizing its energy density and preventing phones from overheating.
Lithium (~ 1–2g), the active electrolyte and cathode material in the battery, has also been linked in to child labour in Zimbabwe (Midlands, Manicaland and Mashonaland East)[35], and in Nigeria (Pasali), where children crush and sort ore with crude stone tools and carry heavy loads [36]. Phones and laptops mostly use cobalt-rich lithium-cobalt-oxide (LCO) cells [32]. Moreover, lithium batteries are collected in informal e-waste recycling, where child labour is prevalent (in Ghana, India, China, Thailand, Bangladesh and Indonesia) [37].
Manganese (~ 0.5–1g), used in cathode alloying, is linked to unbraced underground digging in Zambia's Luapula and Central provinces, where children ages 10-14 [38] mine manganese ore under hazardous conditions [39], risking debilitating neurological conditions from inhaling neurotoxic manganese dust. If demand for manganese increases [33], children in regions with manganese deposits where child labour is present in the mining of different minerals (e.g. Ghana and India) may be at risk.
Natural graphite is used for the graphite electrode, the negative side of a lithium-ion battery, where lithium ions are stored during charging and released during discharge. Without it, the battery cannot function. Although there are no confirmed cases of child labour in natural graphite mining, the presence of ASM and socioeconomic vulnerabilities in Madagascar and Mozambique put children at risk: recent research projections indicate that child labour in graphite mining is likely to increase in the coming years due to increased demand [9, 40].

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[d] In the literature studies that quantify metals in mobile phones, the number of different metals found in a smartphone started around 38 [1], with up to 53 metals being analysed [23]. The figures are not contradictory, as they measure different things, thus each is best read as a minimum rather than a total.
[e] Note: estimates might differ based on product model and have been approximated based on multiple sources [15, 27, 79]

Circuit-board and connector minerals.

Copper (~ 15–20g or 6% of mass) is a great conductor of heat and electricity, which is why it is typically used in connectors, printed circuit boards and internal wiring [26], electromagnetic shielding, motherboard ground planes, and lithium battery anode foil backings. It is frequently co-extracted with cobalt at the same DRC open-pit sites, so is presumed to share its labour risks despite thinner direct reporting [9, 41]; in Zambia's Copperbelt, exposure is compounded by an informal economy that accounts for 76% of national economic activity [39]. Minerals extracted through informal mining are typically sold to local traders and intermediaries before entering national and international markets, making it difficult to distinguish responsibly sourced minerals from those linked to child labour. In Peru, children have been found to participate in activities such as ore extraction, transportation and processing [42, 43]. These tasks expose children to hazardous working conditions, including heavy physical labour, dangerous equipment, dust and other occupational health and safety risks. Copper extraction also contributes to water pollution and water stress in Chile [44] which raises environmental concerns for indigenous communities.

Tin (~ 1–3g), extracted from cassiterite ore, is used in the soldering alloy binding micro-components to the board. It is part of the 3TGs (tin, tantalum, tungsten and gold) that are associated with child labour in DRC [45]. In Bolivia's Potosí cooperatives [46], children from 13 years old have been victims of tunnel collapse due to the use of explosives. It is estimated that ASM accounts for approx. 40% of global tin production, which raises the risk of child labour in regions where data is underreported. In Indonesia's Belitung region there are documented cases of children ages 15-17 in the production unit, and younger children in panning (using a pan to separate sand from residual materials) [47]. Children operate pressurised water hoses and dig in unbraced pits prone to landslide and pan in open waters risking drowning [47].

Tantalum (~ 0.1–0.3g), extracted from coltan ore, is another conflict mineral (3TGs) [48], essential to the memory storage of portable devices and high-volumetric micro-capacitors - which are critical for voltage regulation in restricted spatial layouts. About half of mined tantalum comes from the DRC, much of it from the Kivus: the Rubaya mines (about 15% of world supply of coltan [49]) have been held under armed-group control by M23 since April 2024, with unprotected shaft collapses reportedly burying children alive as recently as March 2026 [50].

Tungsten (from wolframite ore) is used as contact metal in chips and, by mass, in vibration-motor weights. DRC is a small, high-risk source of tungsten, where children ages 5-17 are forced to work, sometimes under the threats of armed groups. Tungsten is one of the 3TGs (tantalum, tungsten, tin, gold) which are seen as conflict minerals [48]. Gold (~0.02–0.03g) used for plating PCB traces, SIM contacts and connectors, spans an unusually wide geography of concern [51, 52]: DRC, Zimbabwe, Cameroon, Venezuela, Uganda, Niger, Central African Republic, Colombia, Ecuador, Ethiopia, Guinea, Indonesia, Kenya, Mongolia, Nicaragua, Senegal, Sudan, Suriname [18], Bolivia [46], the Philippines [53], Peru [54], Tanzania [55], Burkina Faso [56], Mali [57], Nigeria [58], Ghana [59], Mozambique [60] . Across the world, children face dangerous conditions in gold mining and are especially vulnerable to the unprotected use of liquid mercury for amalgamation [61].

Silver (~ 0.25-0.35g) is used in conductive pastes, solder, contacts and shielding; US DOL lists silver mining among the work children do in Bolivia (alongside gold, tin, lead and zinc) [46] and DOL figures mention Peru only up to 2019 (only gold in 2024) [54].

Structural and casing minerals.

Zinc (~ 1–2g), used in USB-C port shielding and structural alloy brackets, draws concern from Bolivia's Potosí and Oruro cooperative mines, where children work underground handling explosives and heavy loads [46, 62, 63].

Nickel, present in stainless steel brackets, plating for electromagnetic shielding, capacitors, and some battery cathodes, concentrates human rights abuses in Indonesia and the Philippines [64]. In Indonesia, although there are no documented cases of child labour specifically linked to nickel mining, the risk is considered high and therefore earns a spot on this list, as communities face land seizures and contaminated fishing grounds, increasing their vulnerability [65, 66]. In the Philippines, child labour has been documented in informal and subcontracted activities associated with nickel mining operations [43] and other forms of harmful activities towards the local community [67, 68]. Madagascar, another exporter of nickel, can be considered a risk region due to the inferred presence of child labour in the extraction of other minerals [34].

Aluminium (~24% of phone mass by weight) is the refined bauxite ore which makes up structural accents and internal heat shields. Because extracting and transporting bauxite requires significant capital investment, operations are predominantly industrial in scale. However, risk arises later down the line: there is risk of child labour in adjacent activities in India's bauxite mining (e.g. loading and unloading) [43]. The risk is compounded by informal e-waste recycling hubs such as Seelampur, Delhi, where thousands of children dismantle discarded electronics to recover secondary aluminium and copper [69, 70]. Reports indicate that in Seelampur, the largest market for e-waste in India, thousands of children are estimated to be primarily engaged in the dismantling of e-waste, which includes stripping wire to obtain recycled copper or aluminium, segregating lithium from batteries, breaking circuit boards, and burning metals like mercury, lead, and arsenic [70].

Chromium, from chrome ore, can still be found in pigments, stainless steel plating and coatings of electronic components [26]; there are child labour cases flagged in Zimbabwe's Shurugwi [71] and Albania's Bulqiza municipality [72]. Mining and processing can generate hexavalent chromium, a known carcinogen [73], and child miners face elevated respiratory illness and death.

Minor and trace elements.

Mica (~0.2–0.5g), used for thermal and dielectric insulation, is hand-dug from narrow, unregulated shafts in India's Bihar and Jharkhand states [74] and in southern Madagascar, exposing child workers to silicate dust and respiratory illness [75, 76].

Indium, a trace component of touch screen conductive film, is extracted as a zinc byproduct in Bolivia and inherits that mineral's labour-rights exposure [77]. There are indications that there may also be child labour for indium reported in Peru and Uzbekistan [34], but there is not enough available data to confirm. Rare earth elements neodymium (about 0.05 g) and praseodymium (about 0.01 g), which magnetise speakers and haptic engines, are sourced from informal open-pit operations in Myanmar - Global Witness (2024) reports one 15-year-old's death, which his family attributed to toxic chemical exposure in mining [78].

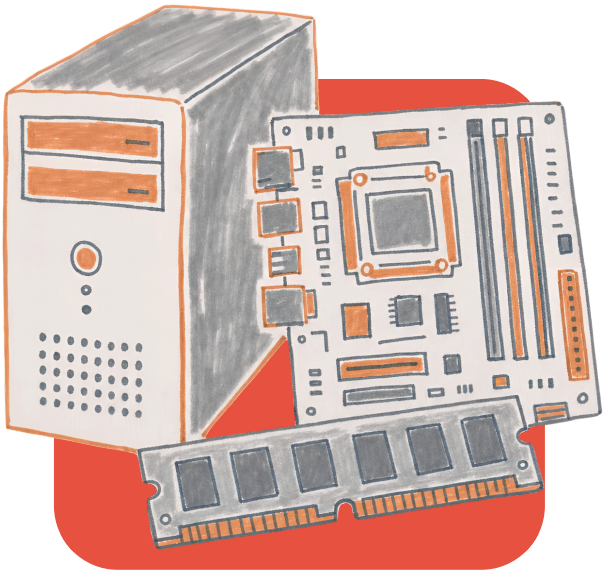
Laptops & Computers



A laptop draws on the same mineral base as a smartphone (e.g. cobalt, tin, tantalum, gold), but in larger quantities, spread across a bigger battery, motherboard, and metal or metal-alloy chassis. Laptops also introduce materials smartphones rarely carry at scale: significant aluminium or magnesium-alloy bodies, and in older or budget models, hard-disk drives containing rare-earth magnets. Because around 180 million laptops are sold every year, and because laptops have multi-tier component supply chains (batteries, boards and casings are typically sourced from separate contract manufacturers), tracing any single mineral back to a mine becomes increasingly difficult.

Below is a non-exhaustive overview of the minerals (and their quantities where known)[f] found in laptops and computers which have documented cases or risks of child labour, the components that contain them, and the geographies of concern.





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[f] Note: unlike smartphones, no publicly available teardown study discloses precise per-model gram figures for every mineral in a laptop; ranges above are drawn from published battery-chemistry and e-waste composition data and should be read as indicative, not exact.

Child Labour Risk Minerals in Laptops and Computers

Battery minerals.
Cobalt (approx. 65g, cathode material for the lithium-ion pack) carries the same DRC exposure as in smartphones: in Lualaba and Haut-Katanga provinces, children from around age seven dig, wash and carry ore in artisanal pits supplying the formal battery-materials trade [20, 30]. This is the most extensively documented mineral-child labour link in computing, and the one most directly tied to laptop producers. Lithium, the battery's electrolyte and cathode material, is mined using child labour in Nigeria [36] and Zimbabwe [35], while manganese, used in cathode alloying, carries child-labour risk from artisanal sites in Zambia [39].

Circuit-board and connector minerals.
Copper, used throughout the motherboard, internal wiring and shielding, is co-extracted with cobalt at the same DRC Copperbelt sites [9, 41] and separately documented in Zambia's [38, 39] and Peru's informal mining sector [42, 43].
Tin, which solders every component to the board, is sourced with documented child-labour risk from Indonesia [47], Bolivia [46] and from the DRC [45], where children dig unbraced pits and pan ore under landslide and drowning risk.
Tantalum (approx. 1.7g), used in the capacitors that regulate voltage on the board (laptops carry substantially more capacitors than phones owing to larger, more complex motherboards) can originate from DRC, where in 2025 approximately 52% of the world's tantalum was produced, incl. from conflict-affected Kivu provinces reportedly under armed-group control [49].
Tungsten, used in vibration components and as a heat-resistant element in some internal hardware, shares this Kivu geography and its forced-labour dynamics [48].
Gold, present in trace amounts (0.1 grams) as connector, RAM-contact and circuit-trace plating in the Motherboard (54%) and other PCBs (46%) may be sourced from at least one of the documented child-labour regions elaborated in the previous chapter. Indium (approx. 0.04g), used in touchscreen and conductive film in display panels, is a documented byproduct of zinc mining in Bolivia and inherits that mineral's child-labour exposure [46] and potential risks in Peru and Uzbekistan [34].

Structural and casing minerals.
Laptop bodies are typically aluminium, magnesium alloy, or a combination of the two.
Aluminium carries a risk in adjacent activities in India [43]. In Seelampur, Delhi, children dismantle discarded laptops and computers to recover secondary aluminium and copper [69].
Nickel, used in steel chassis components, hinges and battery cathodes, is associated in the Philippines with no formal child labour in its extraction, but children can be found working in informal and subcontracted activities [43, 67, 68], while in Madagascar and Indonesia there is inferred risk of child labour due to the presence of a concentration of vulnerability factors [34, 65, 66].
Zinc, used in structural alloys and port shielding, raises child labour concerns in Bolivia's Potosí and Oruro cooperative mines [46, 62, 63].

Legacy and minor components.
Older and lower-cost laptops still shipping with a hard-disk drive (rather than solid-state storage) contain rare-earth elements **neodymium/dysprosium** magnets used in spindle motors (HDD/optical), voice-coil actuator and loudspeaker magnets, sharing the same Myanmar risk [78].
Mica, used for thermal and dielectric insulation around the battery and board, is hand-dug in India's Bihar and Jharkhand states and in Madagascar under the same conditions documented in the smartphones chapter [74, 75, 76].

Minerals listed: Cobalt, Lithium, Manganese*, Copper, Tin, Tantalum, Tungsten, Gold, Zinc*, Nickel, Aluminium, Mica, Indium, REEs (neodymium and dysprosium)

*** Conditional on model or inferred from component type**



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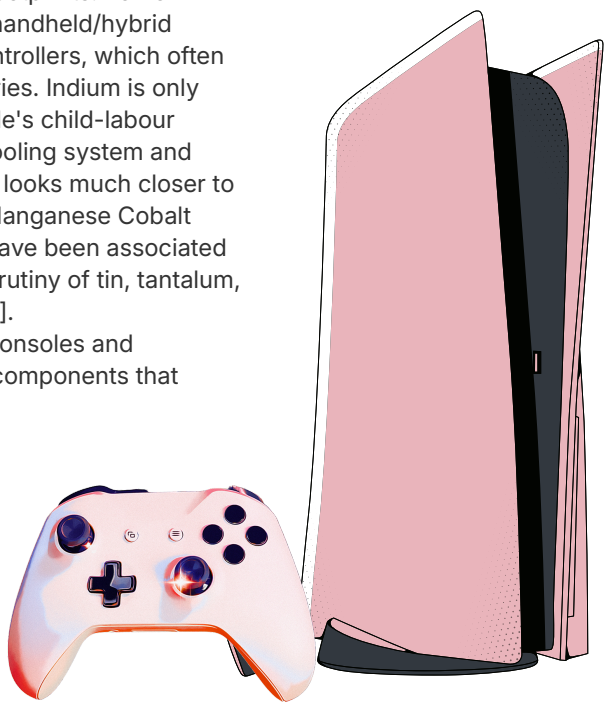
Gaming Consoles

Gaming hardware splits into three device types with different mineral footprints: home consoles that draw AC power directly and contain no internal battery; handheld/hybrid consoles that carry a phone-scale lithium-ion battery; and wireless controllers, which often ship with a small rechargeable battery of their own, or run on AA batteries. Indium is only present in handheld consoles with displays. This means a home console's child-labour mineral exposure is concentrated almost entirely in its motherboard, cooling system and casing rather than its power source; while a handheld console's profile looks much closer to a smartphone's, so lithium, graphite and any manganese from Nickel Manganese Cobalt Oxide (NMC) cells apply only to handhelds and controllers. Consoles have been associated in the public record with mineral-driven conflict: industry and media scrutiny of tin, tantalum, tungsten and gold ("3TG") in consoles dates to the early 2000s [80, 81].
Below is a non-exhaustive overview of the minerals[9] found in gaming consoles and controllers which have documented cases or risks of child labour, the components that contain them, and the geographies of concern.



Child Labour Risk Minerals in Gaming Consoles

Battery minerals (present in handhelds and controllers only).
Cobalt, the cathode material in lithium-ion cells, is present in handheld-console batteries at a scale comparable to a large smartphone battery, and in smaller form in each wireless controller's internal pack. Its DRC exposure is identical to the smartphone and laptop chapters: children from around age six working artisanal pits in Lualaba and Haut-Katanga provinces [82]. Home consoles themselves contain no comparable battery and therefore carry negligible direct cobalt exposure, though their external power bricks and any bundled accessories may still contain small cells.
Lithium child labour mining was recently documented in Nigeria [36], and Zimbabwe [35]. **Manganese** carries the same Zambia risks noted in the earlier chapters [39].

Circuit-board and connector minerals.
This is where console exposure is heaviest, because a console motherboard (especially in home consoles) packs a full CPU/GPU die, high-bandwidth memory and extensive power-delivery circuitry. **Tin** solder, **tantalum** capacitors, **tungsten** (the 3Ts) all carry the same DRC [45, 48, 49] and Bolivia [46] and Indonesia [47] linked risk documented in the earlier chapters. **Gold**, present in plating, may be sourced from regions where child labour in gold mining has been documented [see e.g. 51, 52]. [CR1] **Coltan** (tantalum ore) prices rose about tenfold in the 2000s; analysts point to mobile-phone demand and speculation. The UN Panel linked the coltan trade to armed groups instead [81]. **Copper**, used extensively in console motherboards, heat pipes and internal wiring, can also be extracted from DRC, Peru and Zambia's Copperbelt, where cases of child labour are reported [9, 38, 39, 41, 42, 43].

Structural and casing minerals.
Console bodies are predominantly aluminium and steel, used for the chassis, internal heat-sink structures and shielding. Home consoles in particular rely on large aluminium or steel heatsinks to dissipate the heat of a full desktop-class chip, so structural metal content per unit is higher than in phones or laptops. This carries the same India bauxite/e-waste exposure documented previously [43, 69]. Zinc, used in port shielding and some structural alloys, is mined with child labour in Bolivia [46, 62, 63]. Nickel, used in steel components, has child labour cases in the Philippines [43, 67, 68], while Indonesia [65, 66] and Madagascar [77] can be considered risk-regions.

Minor and trace elements.
Rare-earth elements neodymium/dysprosium magnets are used in console and controller speakers, and in older console generations still shipping with an internal hard-disk drive rather than solid-state storage (e.g., older-generation console hard-drive models), in the drive's spindle and voice-coil motors, carrying the same Myanmar sourcing risk [78]. Controllers' haptic-feedback motors also rely on small rare-earth magnets. Mica, used for thermal/dielectric insulation around power-delivery components, is dug up or picked from the soil (scrap mica) in India and Madagascar [74, 75, 76].

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Minerals listed: Cobalt, Lithium (handhelds + controllers only), Manganese*, Copper, Tin, Tantalum, Tungsten*, Gold, Zinc*, Nickel, Aluminium, Mica, Indium (handhelds only)*, REES (Nd, Dy)*

*** Applicable for some models**

[9] Note: unlike previous chapters, no publicly available bill-of-materials study was found that measures mineral content for consoles or controllers.

Headphones



Headphones range from passive wired units with no electronics beyond a driver and a cable, to fully wireless earbuds that pack a lithium battery, Bluetooth chip, and active-noise-cancellation circuitry into a shell smaller than a coin. This split matters for mineral exposure: a wired headphone's footprint is limited to its driver magnet, voice-coil copper, and casing metal; a wireless model adds the full battery and PCB-mineral profile seen in the smartphone and laptop chapters, just at a far smaller scale. The component that turns an electrical signal into sound from headphone drivers most often uses neodymium magnets.
Below is a non-exhaustive overview of the minerals[f] found in headphones which have documented cases or risks of child labour, the components that contain them, and the geographies of concern.

Child Labour Risk Minerals in Headphones

The driver (present in every headphone, wired or wireless). **Copper** is used to make the voice coil, a small wire coil inside the driver that helps convert electrical signals into sound. The regions of concern for copper sourcing are the DRC, Peru and Zambia Copperbelt, as established in earlier chapters [9, 38, 39, 41, 42, 43]. **Rare-earth neodymium** (and often a smaller **dysprosium** fraction, added for heat resistance) forms the driver's permanent magnet, the component that generates the magnetic field the voice coil moves against, and is specified by audio manufacturers precisely because of its high flux density relative to size. This magnet's mineral-sourcing risk mirrors the smartphone and laptop chapters: Myanmar's informal, open-pit operations are the principal documented concern for neodymium/dysprosium supply [78].

Battery minerals (wireless and noise-cancelling models only). **Cobalt**, **lithium**, and **manganese** can be present in Bluetooth or ANC (active noise cancelling) headphones's lithium-ion cell, typically a very small pack (on the order of hundreds of milliamp-hours for wireless earbuds, somewhat larger for over-ear wireless models). Where cobalt is sourced from the DRC, the concerns described in the earlier chapters are also relevant to headphone batteries [20, 30]. A fully wired, non-ANC headphone contains no comparable battery and so carries very little cobalt/lithium exposure.

Circuit-board minerals (wireless and ANC models). Wireless and noise-cancelling headphones carry a small PCB for the Bluetooth radio and (in ANC models) digital signal processing. This board uses tin solder, tantalum capacitors, and gold-plated contacts and charging-case connectors, carrying the same child labour risks established in DRC [18, 45, 49], Indonesia [47] / Bolivia [46] and other areas with gold deposits, which have been present for every other product in this catalogue. Wired, non-electronic headphones carry little to none of this exposure, their only connector-related mineral use is typically gold or nickel plating on the jack plug itself.

Casing and structural minerals. Premium and over-ear headphones commonly use aluminium or steel in the headband, hinges, and earcup frame for durability and a premium feel, alongside plastic housings (polycarbonate, ABS) that fall outside this catalogue's mineral scope. Therefore, the child labour risk for casing and structural components is linked with the India aluminium risk [43, 69]. Nickel, used for headband steel and jack-plug plating, carries the Philippines documentation [43, 67, 68] and Indonesia/Madagascar risk [65, 66, 77] already established in previous chapters.

Minerals listed: Copper, REEs (neodymium), Cobalt (Bluetooth or ANC headphones), Lithium (Bluetooth or ANC headphones), Manganese (Bluetooth or ANC headphones), Tin, Tantalum (Bluetooth or ANC headphones), Gold, Aluminium (premium models), Nickel

[f] Note: as with gaming consoles, no dedicated bill-of-materials study measuring mineral content specifically for headphones or earbuds was found. Exact per-unit quantities are not available and are not estimated here.

Upgrade Now

To Child Labour-free Tech



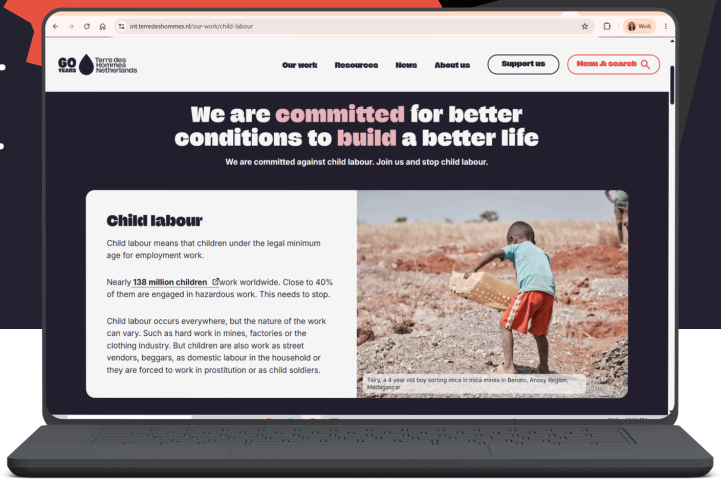
Our message is clear:

Child labour has no place in the technology of the future. Behind the electronic devices we use every day there may be minerals extracted by children working in hazardous conditions. This report sheds light on these risks and calls on both governments and businesses to take responsibility. Together, we can work towards transparent, responsible and child-labour-free supply chains, ensuring that no child has to sacrifice their health, safety or future for our technology.

Sign the petition directly on our website to push for a future with child labour-free tech. Demand:

- ✔ **Living incomes for mining communities.**
- ✔ **Transparency in mineral supply chains.**
- ✔ **Ethical procurement procedures.**

Sign the petition!





Terre des Hommes Netherlands

Terre des Hommes Netherlands (TdH NL) is an international child rights organisation and has worked for nearly a decade to combat child labour in the mica supply chain in India, guided by its mission to "let children flourish in a world free of exploitation". TdH NL and our local partners specialise in root interventions, establishing alternative livelihoods, cooperatives, and Child Rights Clubs to secure an ethical mica supply chain at its source, where children can be out of mines and be at school.

"Mede Mogelijk Gemaakt Door..." Campaign

Visit our website.

https://int.terredeshommes.nl/

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