

CRITICAL RAW MATERIALS IN PHONES

Tungsten

Due to its **high melting point**, tungsten is used in electrical connections and acts as a **heat sink** by absorbing and redistributing excessive heat. Tungsten is also used as a counterweight in the vibration motor due to its **heavy weight**.

Beryllium

Due to their unique combination of **high conductivity** with **high stiffness**, copper beryllium alloys are used in electric connectors. The strong formability of the alloy allows for miniaturization.

Indium

Indium tin oxide is an **electrically conductive** material necessary for the functioning of touch screens. Touch screens rely on a very thin layer of indium tin oxide.



Lithium, Cobalt

Lithium-ion batteries are high in **energy density** offering longer battery life with less weight. Cobalt containing Lithium-ion batteries contributes to the **thermal stability** of the battery. Cobalt is also used in integrated circuits due to its electrical resistivity and wear resistance.

Silicon Metal

Layers of silicon metal are used to create smartphone processors.

Gallium

Gallium arsenide has a high socio-economic importance, used for **VSCSEL** (Vertical-Cavity Surface-Emitting Laser used in IR sensors) and in **low-noise**, high-power radio frequency chipsets. Gallium nitride is needed in white **LEDs** used for LCD screen backlighting, flashlight, and torch.