

# Bill of Materials (BOM): For Vision System

Item	Description & Necessity	Link (Finland/EU)	Est. Cost
1. Raspberry Pi 5 (8GB RAM)	<b>The Brain.</b> We need the 8GB model because computer vision buffers (video frames) consume significant RAM. The Pi 5 is 2-3x faster than the Pi 4, which is crucial for real-time tracking.	<a href="https://partco.fi">partco.fi</a>	€99
2. Official USB-C Power Supply (27W)	<b>Power.</b> The Pi 5 is power-hungry. Standard phone chargers will not work; the Pi will detect them and slow down (throttle) automatically. We <i>must</i> use the official 27W PD supply.	<a href="https://partco.fi">partco.fi</a>	€20.20
3. Active Cooler for Pi 5	<b>Cooling.</b> Vision processing pushes the CPU to 100%. Without this fan/heatsink combo, the Pi will overheat in <1 minute and lag the robot.	<a href="https://Partco.fi">Partco.fi</a>	€10.10
4. Raspberry Pi Global Shutter Camera	<b>The Eye.</b> This specific camera (Sony IMX296) captures the entire image at once. It eliminates "motion blur" and the "jelly effect" caused by moving conveyor belts.	<a href="https://Partco.fi">Partco.fi</a>	€85
5. 6mm CS-Mount Lens	<b>The Optic.</b> The Global Shutter camera does not come with a lens. A 6mm Wide-Angle lens allows us to mount the camera closer to the belt and still see the whole width.	<a href="https://Partco.fi">Partco.fi</a>	€30.00
6. Camera Cable (Mini to Standard)	<b>Connection. Critical:</b> The Pi 5 uses a smaller "Mini" connector than the Pi 4. The cable included with the camera usually fits Pi 4. We need this adapter cable.	<a href="https://Partco.fi">Partco.fi</a>	€3.00
7. MicroSD Card (32GB A2 Class)	<b>Storage.</b> Holds the Operating System. The "A2" rating (Application Performance Class 2) makes the OS boot and run programs significantly faster.	<a href="https://Verkkokauppa.com">Verkkokauppa.com</a>	€25.30
8. LED Strip (12V Cool White)	<b>Lighting.</b> We need consistent light.	<a href="https://ikea.com">ikea.com</a>	€12.99

**Total Estimated Cost: €285.59**