

Bill of Materials (BOM): For Vision System

Item	Description & Necessity	Link (Finland/EU)	Est. Cost
1. Raspberry Pi 5 (8GB RAM)	The Brain. 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.	partco.fi	€99
2. Official USB-C Power Supply (27W)	Power. 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.	partco.fi	€20.20
3. Active Cooler for Pi 5	Cooling. Vision processing pushes the CPU to 100%. Without this fan/heatsink combo, the Pi will overheat in <1 minute and lag the robot.	Partco.fi	€10.10
4. Raspberry Pi Global Shutter Camera	The Eye. This specific camera (Sony IMX296) captures the entire image at once. It eliminates "motion blur" and the "jelly effect" caused by moving conveyor belts.	Partco.fi	€85
5. 6mm CS-Mount Lens	The Optic. 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.	Partco.fi	€30.00
6. Camera Cable (Mini to Standard)	Connection. Critical: 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.	Partco.fi	€3.00
7. MicroSD Card (32GB A2 Class)	Storage. Holds the Operating System. The "A2" rating (Application Performance Class 2) makes the OS boot and run programs significantly faster.	Verkkokauppa.com	€25.30
8. LED Strip (12V Cool White)	Lighting. We need consistent light.	ikea.com	€12.99

Total Estimated Cost: €285.59