GETTING THE TEMPERATURE RIGHT

Emissivity & reflected temperature *field guide.*

Two settings sit between the camera and a defensible temperature. Emissivity (ε) is how efficiently a surface radiates; reflected apparent temperature is the background the surface mirrors into the lens. Set either one wrong and every reading on that target is wrong.

01 / REFERENCE Typical emissivity values

MATERIAL / SURFACE	TYPICAL E
Electrical tape, matte black	**0.95**
Flat / matte paint (any color)	0.90–0.95
Oxidized / weathered steel	0.80–0.95
Painted or anodized aluminum	0.55–0.90
Oxidized copper	0.60–0.80
Concrete, brick, plaster	0.92–0.95

MATERIAL / SURFACE	TYPICAL E
Roofing felt / asphalt, wood	0.90–0.95
Glass (normal angle)	0.85–0.92
Water	0.95–0.98
Galvanized steel, new	**0.20–0.30**
Shiny / polished aluminum	**0.02–0.10**
Bright / polished copper	**0.03–0.05**

Representative values; verify against your camera's tables and site conditions. Green = safe high-ε targets. Amber/red = low-ε surfaces that read falsely low and mirror their surroundings — measure these with caution.

02 / FIELD RULES Working with emissivity

- **Favor high-emissivity targets.** Painted, oxidized, taped, or matte surfaces give honest readings.
- **Distrust shiny metal.** Bright copper, polished aluminum, and new galvanized read far below their true temperature and reflect nearby heat.
- **Create a known reference** where safe — a strip of electrical tape or a paint dot (ε ≈ 0.95) on a low-e surface gives a measurable spot.
- **Stay consistent.** Record ε for every target so images stay comparable across a job and over time.

03 / REFLECTED TEMP Setting it correctly

Reflected apparent temperature corrects for energy the target mirrors from hot or cold sources around it — sun, sky, ovens, other energized gear. Set it whenever strong sources are nearby. The reflector method:

- **Make a diffuse reflector.** Crumple a piece of aluminum foil, then smooth it over a card, shiny side out — a near-perfect Lambertian mirror.
- **Place it at the target**, facing the camera from the same position and angle you will measure from.
- **Set the camera to ε = 1.0** and read the reflector's apparent temperature. That value **is** the reflected temperature — enter it, then restore the target's real emissivity.
- **Beat reflections** by changing your angle; a hot source that moves across the surface as you shift position is a reflection, not the target.

WHY BOTH CORRECTIONS MATTER

A hot spot is not a finding until emissivity and reflected temperature are set right — and, on electrical gear, until the reading is corrected for load. Get all three in order and the image becomes a defensible measurement; skip one and the number will not survive scrutiny.

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