Onyx M3

EMISSIVITY CHART

Infrared thermometer · 8-14 micron spectral band

Emissivity (0 to 1) describes how well a surface emits the infrared radiation the thermometer measures. Matte and painted surfaces emit well (0.90-0.95); bare, shiny metals emit poorly and reflect their surroundings: the reading then comes out LOWER than the true temperature (burn hazard). Set the instrument emissivity (EMS key on the Fluke 62 MAX, 0.10-1.00 range) to match the target surface.

METALS

Material / surface condition	Emissivity	Range
Aluminum, polished (new tube, fitting) (!)	**0.05**	0.02-0.10
Aluminum, oxidized (aged tube)	**0.25**	0.20-0.40
Steel, oxidized (tank, structure)	**0.80**	0.70-0.90
Steel, polished/machined (cylinder rod, shaft) (!)	**0.10**	-
Stainless steel (process piping)	**0.45**	0.10-0.80
Galvanized steel (conduit, support)	**0.25**	-
Iron, rusted steel	**0.60**	0.50-0.70
Cast iron (casing, pump, engine block)	**0.65**	-
Copper, polished (new tube) (!)	**0.03**	-
Copper, oxidized (aged tube)	**0.65**	0.40-0.80
Brass, polished (new fitting) (!)	**0.03**	-
Brass, oxidized (fitting, valve)	**0.50**	-

NON-METALS AND MISC.

Material / surface condition	Emissivity	Range
Electrical tape (PVC) *	**0.95**	-
Paint, matte, any color (motor, cabinet)	**0.93**	0.90-0.95
Aluminum ("silver") paint (!)	**0.40**	0.30-0.60
Sticker label	**0.95**	-
Paper, cardboard	**0.95**	-
Plastic, opaque (PVC, cable insulation)	**0.95**	-
Rubber (hose, belt)	**0.95**	-
Wood (pallet, floor)	**0.90**	0.80-0.95
Concrete (slab)	**0.93**	0.90-0.95
Brick, red	**0.93**	-
Asphalt	**0.95**	-
Sand, soil	**0.90**	-
Glass (sight glass, window)	**0.85**	-
Ceramic (insulator)	**0.95**	-
Graphite, carbon	**0.75**	0.70-0.85
Water, condensate	**0.93**	-
Ice, frost	**0.97**	0.96-0.98
Oil, thick film (leak, sump) (~)	**0.82**	0.27-0.82
Human skin	**0.98**	-

(!) unreliable reading - use the tape method · Stainless: depends on finish, verify by contact
* field reference (see method below) · Glass: never through it · (~) oil: depends on film thickness

Bare or shiny metal? The tape method

Stick a piece of electrical tape (PVC, emissivity 0.95) on the surface, let it reach the surface temperature, then measure THE TAPE with EMS = 0.95. Matte paint or a heavily oxidized spot works the same way. Never base a decision on a direct reading off polished metal.

- TYPICAL values from tables published by infrared instrument manufacturers (8-14 micron band).
- Surface condition (oxidation, polish, paint, dirt) strongly changes emissivity: when in doubt, verify with a contact measurement.
- Never measure through glass, steam, smoke or dust: aim at the surface directly.