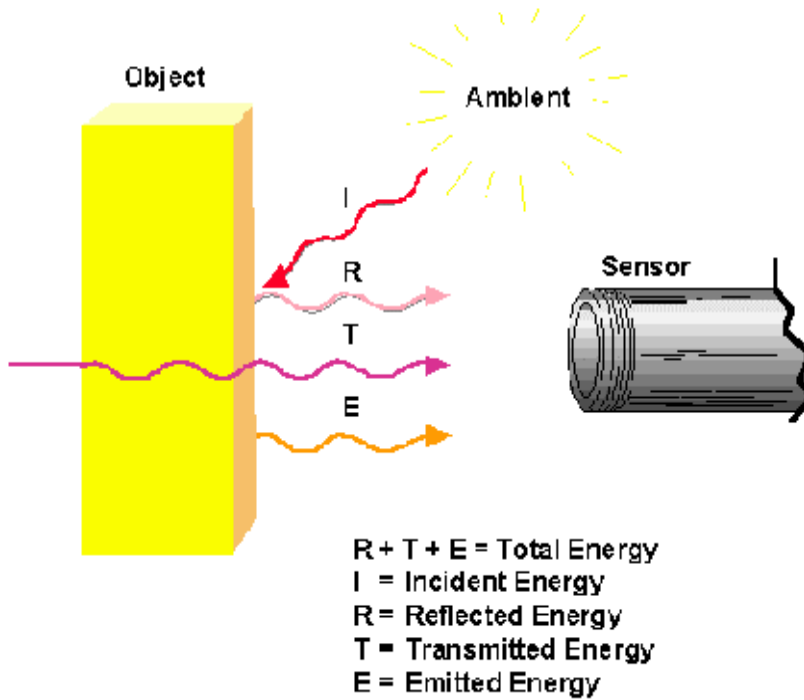


▶ 방사율(Emissivity)

방사율(ϵ)값이란 물체가 외부 적외선 에너지를 흡수, 투과 및 반사하는 비율을 말하며, 이론적으로 외부에너지를 흡수만하고 반사하지 않는 물체를 "Blackbody"라 하며, 이때의 방사율(ϵ)값은 "1"로 규정된다. 그러나 일반적인 물체들은 표면상태(광택, 거칠기, 산화 등)에 따라서 흡수, 반사하는 에너지량이 변화한다. 즉, 흡수하고 반사하는 에너지 비율이 "Blackbody"를 기준으로 할 때 실제로 "1"보다 작은 값을 갖게 된다.

Reflectivity, Transmissivity, Emissivity



► Emissivity Tables (방사율표)

* 아래의 수치들은 실험치이며 절대치가 아님.

METALS (1-color sensors)

Material	Emissivity (in microns)					
	1.0	2.2	3.9	5.1	7.9	8 to 14
Aluminum(알루미늄)						
--Unoxidized	0.1-0.2	0.02-0.2	0.02-0.2	0.02-0.2	0.02-0.1	0.02-0.1
--Oxidized	0.4	0.2-0.4	0.2-0.4	0.2-0.4	0.2-0.4	0.2-0.4
--AlloyA3003,Oxidized	--	0.4	0.4	0.4	0.3	0.3
--Roughened	0.2-0.8	0.2-0.6	0.1-0.4	0.1-0.4	0.1-0.3	0.1-0.3
--Polished	0.1-0.2	0.02-0.1	0.02-0.1	0.02-0.1	0.02-0.1	0.02-0.1
Brass(황동)						
--Polished	0.1-0.3	0.01-0.05	0.01-0.05	0.01-0.05	0.01-0.05	0.01-0.05
--Burnished	--	0.4	0.3	0.3	0.3	0.3
--Oxidized	0.6	0.6	0.5	0.5	0.5	0.5
Chromium(크롬)	0.4	0.05-0.3	0.03-0.3	0.03-0.3	0.02-0.2	0.02-0.2
Copper(동)						
--Polished	0.05	0.03	0.03	0.03	0.03	0.03
--Roughened	0.05-0.2	0.05-0.2	0.05-0.15	0.05-0.15	0.05-0.1	0.05-0.1
--Oxidized	0.2-0.8	0.7-0.9	0.5-0.8	0.5-0.8	0.4-0.8	0.4-0.8
Gold(금)	0.3	0.01-0.1	0.01-0.1	0.01-0.1	0.01-0.1	0.01-0.1
Haynes-Alloy	0.5-0.9	0.6-0.9	0.3-0.8	0.3-0.8	0.3-0.8	0.3-0.8
Inconel						
--Oxidized	0.4-0.9	0.6-0.9	0.6-0.9	0.6-0.9	0.7-0.95	0.7-0.95
--Sandblasted	0.3-0.4	0.3-0.6	0.3-0.6	0.3-0.6	0.3-0.6	0.3-0.6
--Electropolished	0.2-0.5	0.25	0.15	0.15	0.15	0.15
Iron(철)						
--Oxidized	0.4-0.8	0.7-0.9	0.6-0.9	0.6-0.9	0.5-0.9	0.5-0.9
--Unoxidized	0.35	0.1-0.3	0.05-0.25	0.05-0.25	0.05-0.2	0.05-0.2
--Rusted	--	0.6-0.9	0.5-0.8	0.5-0.8	0.5-0.7	0.5-0.7
--Molten	0.35	0.4-0.6	--	--	--	--
Iron, Cast(주조)						
--Oxidized	0.7-0.9	0.7-0.95	0.65-0.95	0.65-0.95	0.6-0.95	0.6-0.95
--Unoxidized	0.35	0.3	0.25	0.25	0.2	0.2
--Molten	0.35	0.3-0.4	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3
Iron, Wrought(정련)	0.9	0.95	0.9	0.9	0.9	0.9

Material	Emissivity (in microns)					
	1.0	2.2	3.9	5.1	7.9	8 to 14
Lead(납)						
--Polished	0.35	0.05-0.2	0.05-0.2	0.05-0.2	0.05-0.1	0.05-0.1
--Rough	0.65	0.5	0.4	0.4	0.4	0.4
--Oxidized	--	0.3-0.7	0.2-0.7	0.2-0.7	0.2-0.6	0.2-0.6
Magnesium(마그네슘)	0.3-0.8	0.05-0.2	0.03-0.15	0.03-0.15	0.02-0.1	0.02-0.1
Mercury(수은)	--	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15
Molybedenum						
--Oxidized	0.5-0.9	0.4-0.9	0.3-0.7	0.3-0.7	0.2-0.6	0.2-0.6
--Unoxidized	0.25-0.35	0.1-0.3	0.1-0.15	0.1-0.15	0.1	0.1
Monel (Ni-Cu)	0.3	0.2-0.6	0.1-0.5	0.1-0.5	0.1-0.14	0.1-0.14
Nickel(니켈)						
--Oxidized	0.8-0.9	0.4-0.7	0.3-0.6	0.3-0.6	0.2-0.5	0.2-0.5
--Electrolytic	0.2-0.4	0.1-0.2	0.1-0.15	0.1-0.15	0.05-0.15	0.05-0.15
Platinum--Black	--	0.95	0.9	0.9	0.9	0.9
Silver(은)	0.04	0.02	0.02	0.02	0.02	0.02
Steel(강)						
--Cold-rolled	0.8-0.9	--	0.8-0.9	0.8-0.9	0.7-0.9	0.7-0.9
--Ground Sheet	--	0.6-0.7	0.5-0.7	0.5-0.7	0.4-0.6	0.4-0.6
--Polished Sheet	0.35	0.2	0.1	0.1	0.1	0.1
--Molten	0.35	0.25-0.4	0.1-0.2	0.1-0.2	--	--
--Oxidized	0.8-0.9	0.8-0.9	0.7-0.9	0.7-0.9	0.7-0.9	0.7-0.9
--Stainless	0.35	0.2-0.9	0.15-0.8	0.15-0.8	0.1-0.8	0.1-0.8
Tin(주석)--Unoxidized	0.25	0.1-0.3	0.05	0.05	0.05	0.05
Titanium(티타늄)						
--Polished	0.5-0.75	0.2-0.5	0.1-0.3	0.1-0.3	0.05-0.2	0.05-0.2
--Oxidized	--	0.6-0.8	0.5-0.7	0.5-0.7	0.5-0.6	0.5-0.6
Tungsten(텅스텐)	--	0.1-0.6	0.05-0.3	0.05-0.5	0.03	0.03
--Polished	0.35-0.4	0.1-0.3	0.05-0.25	0.05-0.25	0.03-0.1	0.03-0.1
Zinc(아연)						
--Oxidized	0.6	0.15	0.1	0.1	0.1	0.1
--Polished	0.5	0.05	0.03	0.03	0.02	0.02

NON-METALS (1-color sensors)

Material	Emissivity (in microns)					
	1.0	2.2	3.9	5.1	7.9	8 to 14
Asbestos(석면)	0.9	0.8		0.9		0.95
Asphalt(아스팔트)				0.95		0.95
Basalt(흑색자기)				0.7		0.7
Carbon(카본)						
--Unoxidized	0.8-0.95	0.8-0.9		0.8-0.9		0.8-0.9
--Graphite	0.8-0.9	0.8-0.9		0.7-0.9		0.7-0.8
Carborundum(탄화규소)		0.95		0.9		0.9
Ceramic(세라믹)	0.4	0.8-0.95		0.85-0.95		0.95
Clay(점토)		0.8-0.95		0.85-0.95		0.95
Concrete(콘크리트)	0.65	0.9		0.9		0.95
Cloth(직물)				0.95		0.95
Glass(유리)						
--Plate		0.2		0.98		0.85
--Gob		0.4-0.9		0.9		

Material	Emissivity (in microns)					
	1	2.2	3.9	5.1	7.9	8 to 14
Gravel(자갈)				0.95		0.95
Gypsum(석고)				0.4-0.97		0.8-0.95
Ice(얼음)						0.98
Limestone(석회암)				0.4-0.98		0.98
Paint(페인트)						0.9-0.95
Paper(제지)				0.95		0.95
Plastic(플라스틱)				0.95		0.95
Rubber(고무)				0.9		0.95
Sand(모래)				0.9		0.9
Snow(눈)						0.9
Soil(흙)						0.9-0.98
Water(물)						0.93
Wood, Natural(나무,자연)				0.9-0.95		0.9-0.95