T&P INSTRUMENTS

TEMPERATURE & PROCESS INSTRUMENTS INC

	1.0 micron	1.6 micron	5.1 micron	8-14 microns
Aluminum				
Non-Oxidized	0.1-0.2	0.02-0.2	0.02-0.2	0.02-0.1
Oxidized	0.4	0.4	0.2-0.4	0.2-0.4
Alloy A 3003				
Oxidized	NA	0.4	0.4	0.3
Roughened	0.2-0.8	0.2-0.6	0.1-0.4	0.1-0.3
Polished	0.1-0.2	0.02-0.1	0.02-0.1	0.02-0.1
Brass				
Polished	0.8-0.95	0.01-0.05	0.01-0.05	0.01-0.05
Burnished	NA	NA	0.3	0.3
Oxidized	0.6	0.6	0.5	0.5
Carbon				
Non-oxidized	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
Chromium	0.4	0.4	0.03-0.3	0.02-0.2
Copper				
Polished	0.05	0.03	0.03	0-03
Roughened	0.05-0.2	0.05-0.2	0.05-0.15	0.05-0.1
Oxidized	0.2-0.8	0.2-0.9	0.5-0.8	0.4-0.8
Gold	0.3	0.01-0.1	0.01-0.1	0.01-0.1
Haynes Alloy	NA	0.5-0.9	0.3-0.8	0.3-0.8
Inconel				
Oxidized	0.4-0.9	0.6-0.9	0.6-0.9	0.7-0.95
Sandblasted	0.3-0.4	0.3-0.6	0.3-0.6	0.3-0.6
Electro-polished	0.2-0.5	0.25	0.15	0.15
Iron				
Oxidized	0.4-0.8	0.5-0.9	0.6-0.9	0.5-0.9
Non-oxidized	0.35	0.1-0.3	0.05-0.25	0.05-0.2
Rusted	NA	0.6-0.9	0.5-0.8	0.5-0.7
Molten	0.35	0.4-0.6	NA	NA
Iron Cast				
Oxidized	0.7-0.9	0.7-0.9	0.65-0.95	0.6-0.95
Non-oxidized	0.35	0.3	0.25	0.2
Molten	0.35	0.3-0.4	0.2-0.3	0.2-0.3
Iron Wrought Dull	0.9	0.9	0.9	0.9
Lead				
Polished	0.35	0.05-0.2	0.05-0.2	0.05-0.1
Rough	0.65	0.6	0.4	0-4
Oxidized	NA	0.3-0.7	0.2-0.6	0.2-0.6
Magnesium	0.3-0.8	0.05-0.3	0.03-0.15	0.02-0.1
Mercury	NA	0.05-0.15	0.05-0.15	0.05-0.15
Molybdenum				
Oxidized	0.5-0.9	0.4-0.9	0.3-0.7	0.2-0.6
Non-oxidized	0.25-0.35	0.1-0.3	0.1-0.15	0.1
Monel (Ni-Cu)	0.3	0.2-0.6	0.1-0.5	0.1-0.14
Nickel				
Oxidized	0.8-0.9	0.4-0.7	0.3-0.6	0.2-0.5
Electrolytic	0.2-0.4	0.1-0.3	0.1-0.15	0.05-0.15
Platinum				
Black -	NA	0.95	0.9	0.9
Silver	0.04	0.02	0.02	0.02
Steel				
Cold-Rolled	0.8-0.9	0.8-0.9	0.8-0.9	0.7-0.9
Ground Sheet	NA	NA	0.5-0.7	0.4-0.6
Polished Sheet	0.35	0.25	0.15	0.1
Molten	0.35	0.25-0.4	0.1-0.2	NA
Oxidized	0.8-0.9	0.8-0.9	0.7-0.9	0.7-0.9
Stainless	0.35	0.2-0.9	0.15-0.8	0.1-0.8
Tin (Non-oxidized)	0.25	0.1-0.3	0.05	0.05
Titanium				
Polished	0.5-0.75	0.3-0.5	0.1-0.3	0.05-0.2
Oxidized	NA-	0.6-0.8	0.5-0.7	0.5-0.6
Tungsten	NA	0.1-0.6	0.05-0.5	0.03
Polished	0.35-0.4	0.1-0.3	0.05-0.25	0.03-0.1
Zinc				
Oxidized	0.6	0.15	0.1	0.1
Polished	0.5	0.05	0.03	0.02

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	1.0 micron	1.6 micron	5.1 micron	8-14 microns
Asbestos	0.9	0.9	0.95	0.95
Asphalt	NA	0.95	0.95	0.95
Basalt	NA	0.7	0.7	0.7
Carborundum	NA	0.9	0.9	0.9
Ceramic	0.4	0.8-0.95	0.95	0.95
Clay	NA	0.8-0.95	0.95	0.95
Concrete	0.65	0.9	0.95	0.95
Cloth	NA	0.95	0.95	0.95
Glass				
Plate	NA	0.98	0.85	0.85
"Gob"	NA	0.9	NA	NA
Gravel	NA	0.95	0.95	0.95
Gypsum	NA	0.4-0.97	0.8-0.95	0.8-0.95
Ice	NA	NA	0.98	0.98
Limestone	NA	0.4-0.98	0.98	0.98
Paint -	NA	NA	0.9-0.95	0.9-0.95
Paper(any color)	NA	0.95	0.95	0.95
Plastic (opaque				
Over 20 mils)	NA	0.95	0.95	0.95
Rubber	NA	0.9	0.9	0.95
Sand	NA	0.9	0.9	0.9
Snow	NA	0.9	0.9	0.9
Soil	NA	NA	0.9-0.98	0.9-0.98
Water	NA	NA	0.93	0.93
Wood, Natural	NA	0.9-0.95	0.9-0.95	0.9-0.95

To optimize surface temperature measurements consider the following guidelines:
1. Determine the object emissivity using the suitable instrument for measurement.
2. Avoid reflections by shielding the object from surrounding high temperature sources.
3. For higher temperature objects use shorter wavelength instruments, whenever any overlap occurs.
4. For semi-transparent materials such as plastic films and glasses, assure that the background is uniform and lower in temperature than the object.
5. Mount the sensor perpendicularly to the surface whenever the emissivity is less than 0.9. In any case, do not exceed angles more than 30 degrees from incidence.

MS Series Handheld Portable Infrared Thermometers
- **Three Models to Choose From**
- **Temperature Ranges up to -32 to 760°C (-30°F to 1400°F)**
- **Precision Optics for Accurate fast Non-Contact Temperature Measurement**
- **Fast Response Time 300 ms.**
- **Laser Sighting Standard**
- **Optics up to 40:1**
- **8 to 14μm Spectral Response**

PSC-PTLST-20 Series High Temperature, Performance, Hand-held
Digital Infrared Thermometer
- **Temperature ranges from 725 to 3252°F (385 to 1800°C)**
- **High optical resolution up to 300:1**
- **Precise aiming with dual laser and scope sighting**
- **Adjustable emissivity from 0.100 to 1.000**
- **Short wavelength spectral responses - minimizes** temperature errors due to changes in product emissivity
- **USB interface, PSC Connect RSoftware Included**
- **Data logger for 2000 measured values**