These tables are presented for use as a guide when making infrared temperature measurements with the OMEGASCOPE® or other infrared pyrometers. The total emissivity (ε) for Metals, Non-metals and Common Building Materials are given.

Since the emissivity of a material will vary as a function of temperature and surface finish, the values in these tables should be used only as a guide for relative or delta measurements. The exact emissivity of a material should be determined when absolute measurements are required.

### Metals

<table>
<thead>
<tr>
<th>Material</th>
<th>Temp. °F (°C)</th>
<th>ε - Emissivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polished</td>
<td>100 (38)</td>
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<tr>
<td>Rolled</td>
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<tr>
<td>Rough</td>
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<td>Molten</td>
<td>1000 (538)</td>
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<tr>
<td>Molten</td>
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<tr>
<td>Nicked Plated</td>
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<tr>
<td>Dow Metal</td>
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<tr>
<td>Gold</td>
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<tr>
<td>Elmax</td>
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<tr>
<td>Plate on .0005 Silver</td>
<td>200-750 (93-399)</td>
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<tr>
<td>Plate on .0005 Nickel</td>
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<td>Haynes Alloy X</td>
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<td>Inconel Sheet 700 (371)</td>
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<td>Inconel Sheet 500 (260)</td>
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<td>Inconel Sheet 300 (150)</td>
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<tr>
<td>Inconel X, Polished</td>
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<td>Inconel B, Polished</td>
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<tr>
<td>2190 (1199)</td>
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<tr>
<td>Nickel Plated 75 (25)</td>
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<td>Wrought Iron</td>
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<td>Unoxidized</td>
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<tr>
<td>Strong Oxidation</td>
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<tr>
<td>Strong Oxidation</td>
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<td>Liquid</td>
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<td>Dull</td>
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<td>Oxidized</td>
<td>100 (38)</td>
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</tr>
<tr>
<td>Oxidized at 1100°F</td>
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<tr>
<td>Gray Oxidized</td>
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<td>Magnesium 100-500 (38-260)</td>
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<tr>
<td>Magnesium Oxide1880-3410 (1027-1727)</td>
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<td>Mercury</td>
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<td>Molybdenum</td>
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<td></td>
<td>1000 (538)</td>
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<td></td>
<td>2000 (1093)</td>
<td>.18</td>
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<td></td>
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<td>1000 (538)</td>
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<td>Monel, Ni-Qu</td>
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<td>Monel, Ni-Qu Oxidized</td>
<td>1112 (606)</td>
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<td>68 (20)</td>
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### Non-Metals and Common Building Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Temp. °F (°C)</th>
<th>ε - Emissivity</th>
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<tbody>
<tr>
<td>Copper</td>
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<td>Cuprous Oxide</td>
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<tr>
<td>Cuprous Oxide</td>
<td>100 (38)</td>
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<tr>
<td>Black, Oxidized</td>
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<tr>
<td>Brazil</td>
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<tr>
<td>Roughly Polished</td>
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### METALS

<table>
<thead>
<tr>
<th>Material</th>
<th>Temp °F (°C)</th>
<th>Emissivity</th>
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<tbody>
<tr>
<td>Titanium</td>
<td>300-1200 (149-649)</td>
<td>0.8-1.9</td>
</tr>
<tr>
<td>Alloy C110M, Polished</td>
<td>200-800 (93-371)</td>
<td>0.51-0.61</td>
</tr>
<tr>
<td>*Oxidized at 538°C (1000°F)</td>
<td>200-800 (93-371)</td>
<td>0.35-0.48</td>
</tr>
<tr>
<td>Nonoxidized</td>
<td>200-600 (93-316)</td>
<td>0.96-0.92</td>
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### NON-METALS

<table>
<thead>
<tr>
<th>Material</th>
<th>Temp °F (°C)</th>
<th>Emissivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramic</td>
<td>68 (20)</td>
<td>0.90</td>
</tr>
<tr>
<td>Asbestos Board</td>
<td>100 (38)</td>
<td>0.96</td>
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<tr>
<td>Cement, Red</td>
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<tr>
<td>Ceramic, White</td>
<td>2500 (1371)</td>
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<tr>
<td>Cloth</td>
<td>198 (93)</td>
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<tr>
<td>Paper</td>
<td>100-700 (38-371)</td>
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<tr>
<td>Slate</td>
<td>68 (20)</td>
<td>0.97</td>
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<tr>
<td>Asphalt, pavement</td>
<td>100 (38)</td>
<td>0.93</td>
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<tr>
<td>Asphalt, tar paper</td>
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<td>0.93</td>
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<tr>
<td>Basalt</td>
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<tr>
<td>Brick</td>
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</tr>
<tr>
<td>Gault Cream</td>
<td>2500-5000 (1371-2760)</td>
<td>0.26-0.30</td>
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<tr>
<td>Fire Clay</td>
<td>2500 (1371)</td>
<td>0.75</td>
</tr>
<tr>
<td>Light Buff</td>
<td>1000 (538)</td>
<td>0.80</td>
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<td>Lime Clay</td>
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<tr>
<td>Fire Brick</td>
<td>1832 (1000)</td>
<td>0.75-0.80</td>
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<tr>
<td>Magnesite, Refractory</td>
<td>1832 (1000)</td>
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<tr>
<td>Gray Brick</td>
<td>2012 (1100)</td>
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<td>Silica, Glazed</td>
<td>2000 (1093)</td>
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<td>Silica, Unglazed</td>
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<tr>
<td>Sandstone</td>
<td>2500-5000 (1371-2760)</td>
<td>0.59-0.63</td>
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<tr>
<td>Barborundum</td>
<td>1880 (1010)</td>
<td>0.92</td>
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### Paints

<table>
<thead>
<tr>
<th>Material</th>
<th>Temp °F (°C)</th>
<th>Emissivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paints, Oil</td>
<td>200 (93)</td>
<td>0.92-0.96</td>
</tr>
<tr>
<td>Black</td>
<td>200 (93)</td>
<td>0.92</td>
</tr>
<tr>
<td>Bright, Galvanized</td>
<td>100 (38)</td>
<td>0.86</td>
</tr>
<tr>
<td>Commercial 99.1%</td>
<td>500 (260)</td>
<td>0.95</td>
</tr>
<tr>
<td>Galvanized</td>
<td>100 (38)</td>
<td>0.28</td>
</tr>
<tr>
<td>Oxidized</td>
<td>500-1000 (280-538)</td>
<td>0.11</td>
</tr>
<tr>
<td>Painted</td>
<td>100 (38)</td>
<td>0.02</td>
</tr>
<tr>
<td>Polished</td>
<td>100 (38)</td>
<td>0.91</td>
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<td>Polished</td>
<td>500 (260)</td>
<td>0.94</td>
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<td>Polished</td>
<td>1000 (538)</td>
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<tr>
<td>Polished</td>
<td>2500 (1371)</td>
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### Gases

<table>
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<th>Material</th>
<th>Temp °F (°C)</th>
<th>Emissivity</th>
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</thead>
<tbody>
<tr>
<td>Uranium Oxide</td>
<td>1880 (1027)</td>
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<tr>
<td>Zircon</td>
<td>Bright, Galvanized</td>
<td>500 (260)</td>
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<tr>
<td>Commercial 99.1%</td>
<td>500 (260)</td>
<td>0.95</td>
</tr>
<tr>
<td>Galvanized</td>
<td>100 (38)</td>
<td>0.28</td>
</tr>
<tr>
<td>Oxidized</td>
<td>500-1000 (280-538)</td>
<td>0.11</td>
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<tr>
<td>Painted</td>
<td>100 (38)</td>
<td>0.02</td>
</tr>
<tr>
<td>Polished</td>
<td>100 (38)</td>
<td>0.91</td>
</tr>
<tr>
<td>Polished</td>
<td>500 (260)</td>
<td>0.94</td>
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<tr>
<td>Polished</td>
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### Other Materials

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Zircon</td>
<td>2500-5000 (1371-2760)</td>
<td>0.59-0.63</td>
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<td>Barborundum</td>
<td>1880 (1010)</td>
<td>0.92</td>
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<tr>
<td>Earthenware, Matte</td>
<td>70 (21)</td>
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<tr>
<td>Greens No. S210-2C</td>
<td>200-750 (93-399)</td>
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<td>Coating No. C20A</td>
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<td>Porcelain</td>
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<td>White Al2O3</td>
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<td>Zirconia on Iron</td>
<td>400-1200 (200-650)</td>
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<tr>
<td>Clay</td>
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<tr>
<td>* Fired</td>
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<td>* Shale</td>
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<td>* Shale, Light Red</td>
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<tr>
<td>*Brown</td>
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<tr>
<td>Smooth</td>
<td>32-200 (0-93)</td>
<td>0.92-0.94</td>
</tr>
</tbody>
</table>
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