Type of pyrometers

How to choose the best version of the pyrometer

There are two main criteria for choosing a pyrometer.

1) The first: What are the target properties that he will measure? The chosen pyrometer should have a spectral range in which the target exhibits maximal emissivity. This helps to achieve the highest IR emittance. For example, while this is less critical for metals, selecting the correct spectral range is crucial when measuring CO2, CO, glass, and polyethylene, as it significantly impacts the measurement accuracy.
   One more aspect to consider when choosing the spectral range is that, on one hand, increasing the wavelength makes the pyrometer more sensitive and able to measure lower temperatures. On the other hand, shorter wavelengths provide greater immunity to variations in target emissivity. Therefore, selecting the appropriate spectral range is crucial when using a single-wavelength pyrometer.

   2) The second important criterion is intermediate properties. The pyrometer wavelength must be immune to variations in intermediate transmittance.

   Guidelines for selecting the appropriate pyrometer type:

a) **Single wavelength** Pyrometer - when the emissivity of the target has minimal variations. Otherwise, it requires a unique setting of emissivity for each new material or measurement condition.

b) **Two-wavelength** or ratio pyrometer, which can measure objects through dust, smoke, "grey bodies," and objects that do not fill the entire field of view of the pyrometer

c) **Multiwavelength** pyrometers capable of measuring high-reflective objects and those with variable emissivity.

Last but very important are peripheral accessories – it depends on installation conditions: What is the distance between the pyrometer and the station that collects measurement results? What does the user need as an output signal – analog proportional signal, digital serial output, alarms, etc.? What are the ambient conditions, e.g., temperature, humidity?