

Our Success in the Wire / Cable Drawing Process

The wire drawing metalworking process is used to reduce the cross-section of wire by pulling it through a series of drawing dies. There are many applications for wire drawing, including electrical wiring, cables, springs, tension-loaded structural components, wheel spokes, paper clips and musical instrument strings. Although it is similar in process, drawing is different from extrusion because the product is pulled rather than pushed through a die.

As wire is pulled through the die, its diameter decreases and length increases. In most cases more than one draw through successively smaller dies is necessary to achieve the desired size as indicated by the (AWG) American Wire Gauge scale. In production of electrical conducting wire, the cross-sectional area of each gauge is important in determining its current carrying capacity.

Manufacture of insulated and sheathed wire cable is heavily dependent on precise temperature measurement and control at numerous critical stages which include wire preheat, wire coating, and braiding or sheathing. Failure to maintain specified temperatures at each stage can result in product deficiencies.

The continuous production process begins with bare wire that is preheated by a mini gas-fired furnace or by induction heating before coatings or insulation is applied. Wire speed and temperature as well as coating material temperatures are critical in maintaining coating thickness. Thickness variations have a negative impact on the dielectric properties and insulation of resistance of electric cables and can also adversely affect downstream processes such as braiding and sheathing, and mechanical handling characteristics in coiling or cable laying equipment. Even though not all wire is used for conducting electricity, all other wire and cable applications involve similar parameters.

Process Sensors IR Corporation's success in the temperature measurement of wire is contributed to application support and its remarkable line of non-contact infrared temperature sensors. Mastering this application combines the challenges of small target size, relatively low temperatures, and the need for fast response.

Bare wire and cable drawing production will benefit tremendously with the use of the **PSC-SSS-Laser-3ML-CF1** pyrometer. It features a temperature range from 50°C to 400°C, fast response time of 1ms, 4-20 mA output, and a remote temperature display. The short measuring wavelength of 2.3µm reduces erroneous temperature readings of surfaces with low emissivity of shiny wires, and

double laser aiming pinpoints real spot location at its focal distance. At an 85mm distance, spot size is 1.4mm.

The **PSC-SSS-Laser-3ML-CF1** thermometer has an optical resolution of 60:1 with optional digital output choices of USB, RS-232, and RS-485. The IR sensor is usable in ambient temperatures up to 85°C without cooling. A variety of hardware accessories is available.

The model **PSC-GE44N** digital, 2-wire, self-contained pyrometer offers precision laser targeting, optical resolution of 85:1, and 4-20mA output. With a scalable temperature range of 75°C to 650°C, high speed response and accuracy along with very small spot size of 3.6mm at a distance of 290mm.

USB programming interface with PC software is optional for adjustments of all IR sensor parameters.



Numerous cable and wire manufacturers as well as machinery OEMs are located throughout the US and Western Hemisphere. Good sources of information on potential customers can be found at www.wirelinks.com and www.wiretech.com.