

## TERMINAL PINS



The Oakley Terminal Pin Division produces terminal pins that are used in tubular heating elements. Terminal pins are produced in high volumes with close tolerances.

Our method of manufacturing preserves the nickel on the formed ends of the pin. This is vital, especially in the area where the coil is welded to the pin. The nickel on the pin will help in the welding process, as well as prevent oxidation, which can result in element failure. This, along with holding very close tolerances, is why our cold-forming process makes us different from other manufacturers.



**SUMMARY**

GENERAL CHARACTERISTICS .....3

TECHNICAL CHARACTERISTICS .....5

AVAILABLE VERSIONS .....5

TERMINAL PIN DIMENSIONS .....7

## GENERAL CHARACTERISTICS

The machinery that we use to produce terminal pins on is an exclusive Oakley Industrial Machinery design. Our process is superior to any other manufacturer as we use a cold roll forming process. This cold forming process allows us to hold very tight tolerances on the pin geometry and further embed the nickel into the core wire.



Because the nickel-ply wire used in the manufacture of pins is supplied with nickel plating as the final manufacturing process, it can be removed when pins are produced using a cutting, or turning process. Our method of manufacturing allows the nickel to remain on the formed ends of the pin.

The pre-plated nickel wire we use is produced as follows:

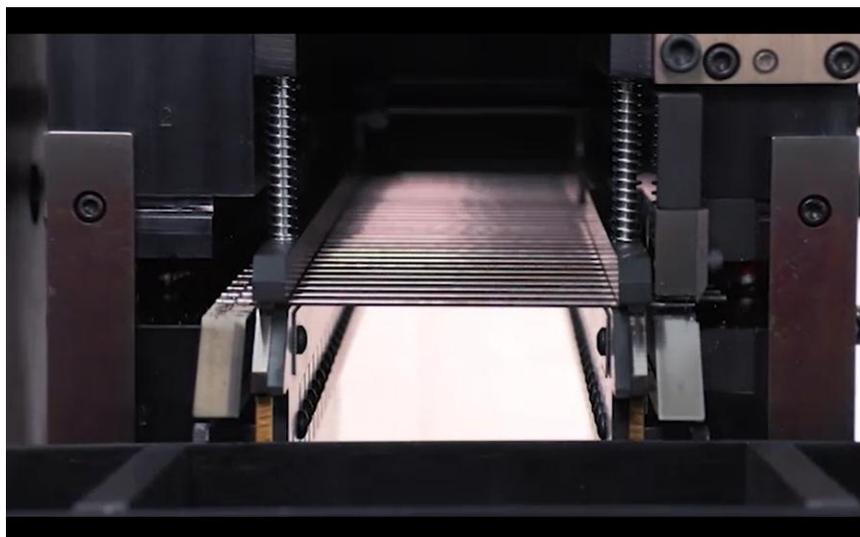
The nickel coating is applied when the wire is still in rod form.



The wire is then drawn down to the final size and the nickel coating becomes embedded in the steel material



Because our Oakley terminal pin machines are cold-forming the parts, the nickel coating is not removed, but rather it is further embedded





## ADVANTAGES

### Close tolerances

We use specially designed cold-forming machines to produce our pins. These machines hold much closer tolerances than screw machines that are commonly used to make these pins.

### Nickel coating

The nickel coating on our pins is impervious to peeling or flaking off and withstands temperatures to 2200°F without melting away or discolouring.

### Enhanced welding of the pins to the coils

The welding of the pins to the coils is greatly improved when the nickel remains embedded in the core wire.

### No oxidation

The nickel remaining embedded in the pin prevents the oxidation of the pin and reduces the risk of element failure.

### Soft wire

The cold-forming process allows us to use a softer wire with a lower tensile strength that makes welding the pin to coil assemblies much easier.

### Quality control

We use statistical process control together with continuous inspection to ensure that our products meet or surpass our customer's specifications. Each individual terminal pin order is manufactured using our specially designed Instant Heat process control chart. Graphs on these charts allow us to control and document critical dimensions for our customers during the actual manufacturing process.

### Pins are delivered all with the same orientation

All of the pins manufactured by Oakley are provided in a consistent orientation. This allows the pins to be easily fed to the machines to install the plastic plugs or weld the pins to the coils.



## TECHNICAL CHARACTERISTICS

We supply our terminal pins from pre-plated material that has an inner core of the same low-carbon steel but then has a 2% by weight coating of nickel.

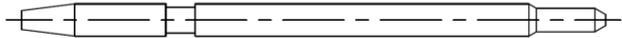
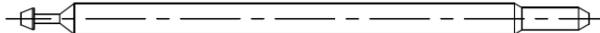
Pin diameter
.091 (2.31 mm)
.105 (2.67 mm)
.114 (2.89 mm)
.125 (3.18 mm)

## AVAILABLE VERSIONS

### TERMINAL PINS

**Length:** 2" (50.8 mm) - 9" (228.6 mm)

**Typical styles of terminal pins:**

<b>Standard Upper Pin</b>	
<b>Standard Lower Pin</b> Washer groove: location to be evaluated <sup>1</sup> We need to have a drawing of the lower pin to evaluate the geometry to ensure we can produce the pin.	
<b>Special Upper Pin</b> This special upper pin with a tapered head allows for easier insertion of the upper or sealing plug on the pins.	
<b>Combination Pin</b> The combination pin can be used for either an upper or a lower terminal pin. Pin diameter: not available in .105" and .125" (2.67 and 3.18mm)	

<sup>1</sup> to ensure that we have the clearance for the dies in the machine for the proper location.

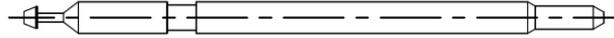
<sup>1</sup> this is the longest we have made to date. Other lengths available but we must consider shipping and handling of the wires.



### Universal Pin

The universal pin can be used for either an upper or a lower terminal pin and also has a tapered head to allow for the easier insertion for the sealing plug.

Pin diameter: only available in .062" and .075" (1.57 and 1.9mm).



The use of the special combination or Universal style pins significantly reduces the number of different pins a customer must stock.

### BLANKS

Straightened and cut wire blanks:

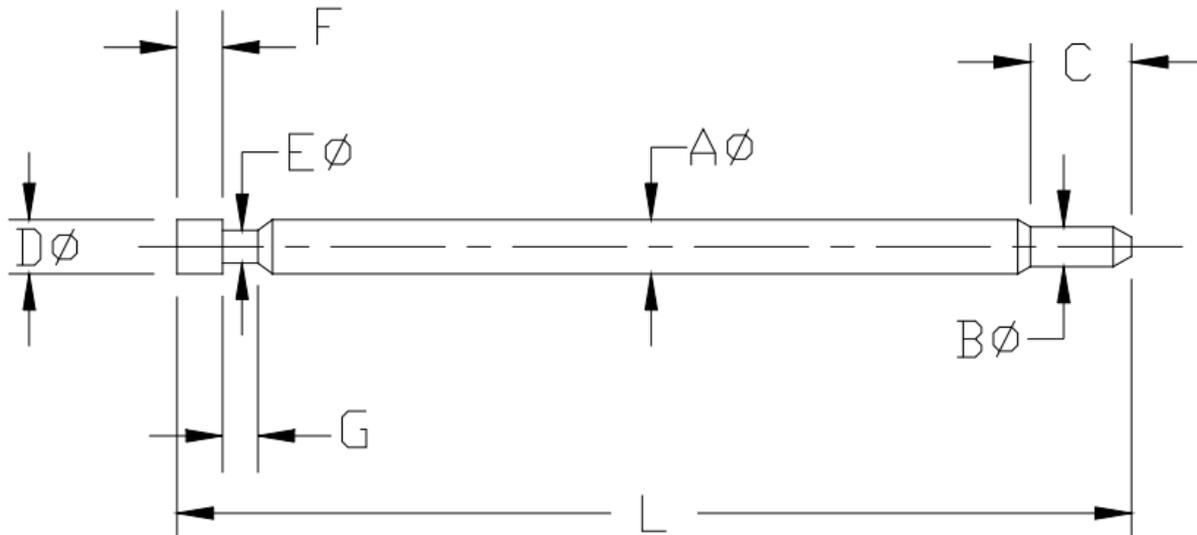
- We can supply straightened and cut wire blanks for the customer to produce their own pins or for other purposes.
- Wire is uncoiled and straightened and cut to length in the Oakley Facility.
- These can be produced in the same materials as listed above.
- Length available: 1.187" (30.15 mm) - 20'-0" (6096 mm)<sup>2</sup>



**TERMINAL PIN DIMENSIONS**

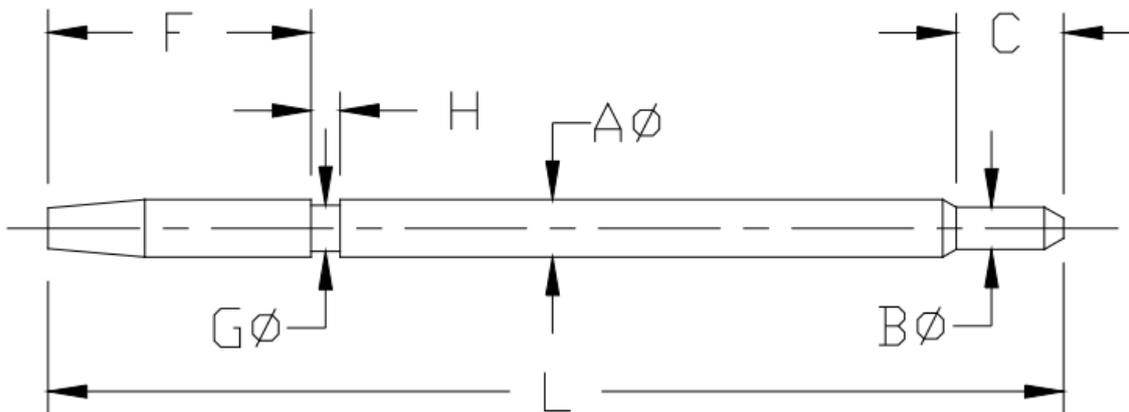
Please provide us the critical dimensions and quantity of your terminal pins for evaluation and quoting.

**Standard Upper Pin:**



A Diameter:	D Diameter:	G Length:
B Diameter:	E Diameter:	L Length:
C Length	F Length:	

**Standard Lower Pin:**



A Diameter:	F Length:	L Length:
B Diameter:	G Diameter:	
C Length	H Length:	