

# “Cement-On” Thermocouples

- ✓ Response Time in Milliseconds
- ✓ Made from 0.013 mm (0.0005") Foil and 0.25 mm (0.010") Diameter Thermocouple Wire
- ✓ Very Low Thermal Inertia
- ✓ Four Calibrations J, K, E, and T
- ✓ Three Styles Ideal for Surface Measurement

OMEGA introduces its Cement-On, fast response thermocouples for fast surface temperature measurement applications in three convenient styles. Styles 1 and 2 are made from 0.013 mm (0.0005") thermocouple alloy foil by a special process where the butt welded thermocouple junction is 0.013 mm (0.0005") in thickness. Styles 1 and 2 are flat, extremely low inertia construction and are an ideal means of measuring the temperature of both flat and curved metals, plastic and ceramic surfaces where very fast response is desired.

OMEGA's Cement-On Style 1 and 2 thermocouples are fabricated from ANSI "Special Limits of Error" grade thermocouple materials in K, E and T calibrations and yield accurate temperature indication when used with standard thermocouple instrumentation.

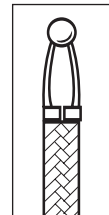
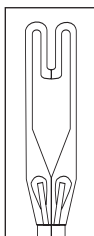
Styles 1 and 2 have the fastest response. Style 3 is an economy version constructed from 0.25 mm (0.010") diameter bead welded standard limit of error thermocouple wire. It should be used where extremely fast response is not essential.

Model CO1

**\$31**



MEETS OR EXCEEDS SPECIAL LIMITS OF ERROR (SLE) AND EN 60584-2: Tolerance Class 1



**ALL MODELS AVAILABLE FOR FAST DELIVERY!**

Model No.	Price	Style	Thermocouple Type	Length	Maximum Temperature °C* (°F)		
					Continuous	600 hr.	10 hr.
CO1-K	\$31	1	K CHROME <sup>®</sup> ALOMEGA <sup>®</sup>	1 m (40")	260 (500)	315 (600)	370 (700)
CO1-E	31		E CHROME <sup>®</sup> Constantan	1 m (40")	260 (500)	315 (600)	370 (700)
CO1-T	31		T Copper - Constantan	1 m (40")	150 (300)	205 (400)	260 (500)
CO2-K	23	2	K CHROME <sup>®</sup> ALOMEGA <sup>®</sup>	150 mm (6")	540 (1000)	540 (1000)	650 (120)
CO2-E	23		E CHROME <sup>®</sup> Constantan	150 mm (6")	425 (800)	425 (800)	540 (1000)
CO2-T	23		T Copper-Constantan	150 mm (6")	150 (300)	150 (300)	260 (500)
CO3-J	17	3	J Iron - Constantan	1 m (40")	260 (500)	370 (700)	370 (700)
CO3-K	17		K CHROME <sup>®</sup> ALOMEGA <sup>®</sup>	1 m (40")	260 (500)	370 (700)	370 (700)
CO3-E	17		E CHROME <sup>®</sup> Constantan	1 m (40")	260 (500)	370 (700)	370 (700)
CO3-T	17		T Copper-Constantan	1 m (40")	205 (400)	260 (500)	370 (700)

\*The temperature range high limits given are greatly influenced by environmental conditions, installation method, accuracy and lifetime requirements and may vary from the general guidelines listed in the table.

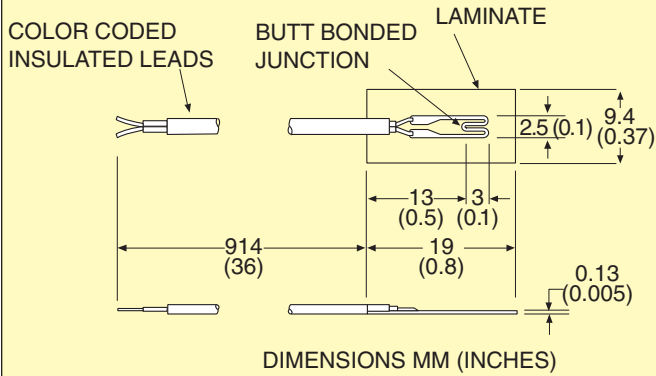
Style 1 and 3 cannot be used with CC High Temperature Cement; CC Cement will break down insulation.

Response time when "grounded" or "cemented" to surface: **Style 1** (10 to 20 milliseconds), **Style 2** (2 to 5 milliseconds), **Style 3** (300 milliseconds). The response time or "time constant" is the time required to reach 63.2% of an instantaneous temperature change.

Additional length wire can be ordered for Styles 1 and 3, add \$4 per 300 mm (12"), for Style 2 add \$8 per 300 mm (12").

**Ordering Example:** CO1-K is a style 1, Type K thermocouple, 1 m (40") long, \$31.

### STYLE 1



### STYLE 1

Cement-On Style 1 thermocouples are the easiest to install. The foil sensor is embedded between two paper thin, glass reinforced high temperature polymer laminates which both support and electrically insulate the foil section as well as provide a flat surface for cementing. The polymer/glass laminate, in general, determines the maximum temperature of the construction which is 260°C (500°F) continuous and up to 370°C (698°F) for short duration. Each Style 1 unit includes 1 m (40") of glass braid insulated 30 gage thermocouple wire which is bonded to the foil and strain relieved by laminate. An application instruction sheet accompanies each packaged Cement-On type thermocouples. Minimum temperature is -195°C (319°F).

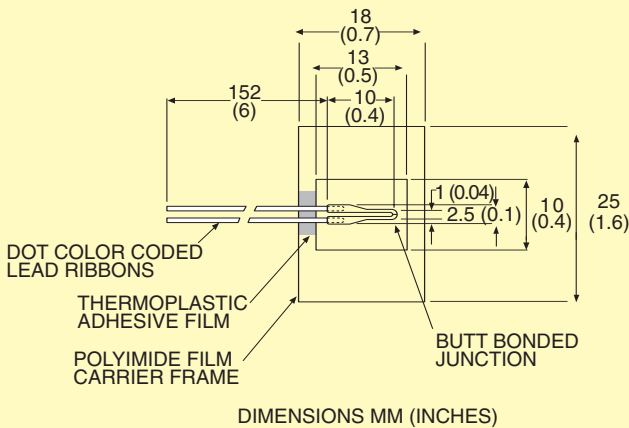
### STYLE 2

OMEGA® Cement-On Style 2 thermocouples are recommended where extremely fast surface temperature measurement response time is a requirement. Intimate thermal coupling for this style is achieved by directly bonding the foil junction area to the surface to be measured. For ease of handling, the foil leads come fastened to a polyimide film frame which is tough, flexible, dimensional, stable material rated for 260°C (500°F) continuous service. During application, the foil thermocouple can be peeled from the frame or released by the application of heat. As an alternate, portions of the frame may be cut away by scissor or knife. Minimum temperature is -195°C.

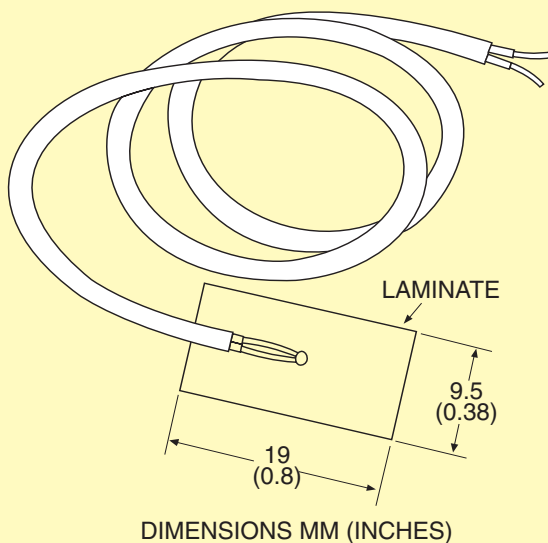
The 150 mm (6") uninsulated foil leads are of 0.05 mm (0.002") material and thus are fragile and should be handled with care during installation.

**Note:** It is imperative that the leads be electrically insulated from each other as well as being mechanically supported. This can be achieved, for example, by laying and brushing the leads into a layer of insulating cement or epoxy. Before doing this on electrically conductive surfaces, it is best to lay down and let dry, a thin layer of the cement to insure that the leads are insulated from the surface. Insulated thermocouple lead wire can be bonded to the foil leads by silver soldering, or resistance welding. Thirty gage, or smaller lead wire is suggested. An application instruction sheet accompanies each package of thermocouples.

### STYLE 2



### STYLE 3



Cementing of the junction and lead may be achieved by using OMEGA® CC high temperature cement for temperatures above 260°C (500°F); OMEGABOND® OB-101 or OB-200 epoxies for temperatures below 260°C (500°F). Please note more care is required to install the Style 2 than Style 1 or 3. It is suggested that at least one additional unit be ordered as some experimentation may be necessary to learn the technique of application for these thermocouples.

### STYLE 3

Style 3 thermocouples are constructed of 30 gage 0.25 mm (0.010") diameter "Standard Limits of Error" wire. The welded bead thermocouple is embedded in a paper-thin laminate intended for surface applications by bonding with added adhesive. Color-coded, glass braid insulated 1 m (40") leads are supplied. Style 3 probes can be used over the range of -184 to 370°C (-310 to 698°F) depending on the adhesive or cement used, the time of exposure and the environment.



For OMEGA® cements and epoxies see Section F.



#### UNITED STATES

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

#### CANADA

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

#### GERMANY

[www.omega.de](http://www.omega.de)  
Deckenpfronn, Germany  
0800-8266342

#### UNITED KINGDOM

[www.omega.co.uk](http://www.omega.co.uk)  
Manchester, England  
0800-488-488

#### FRANCE

[www.omega.fr](http://www.omega.fr)  
Guyancourt, France  
088-466-342

#### CZECH REPUBLIC

[www.omegaeng.cz](http://www.omegaeng.cz)  
Karviná, Czech Republic  
596-311-899

#### BENELUX

[www.omega.nl](http://www.omega.nl)  
Amstelveen, NL  
0800-099-33-44



## More than 100,000 Products Available!

### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters