Temperature measurement solutions for the semiconductor industry: Thermocouples
Assemblies for semiconductor processing

BASF supplies profile thermocouples to both manufacturers of original equipment and to end users. We have long been a leading supplier of profile and spike thermocouples, and epilayer thermocouples to the semiconductor industry. We offer profile and spike thermocouples for furnaces including Tel, Kokusai, ASML, and ASM. BASF precious metal thermocouples utilize R, S, B, Platinel®-K, and PII type wires. Platinel® thermocouple wire (PII) is a proprietary metal combination developed by BASF. We produce profile thermocouples with 0.020” wire that delivers a longer lifespan. And, our scrap metal return program saves you money on future orders.

BASF engineers work directly with end users to customize their traditional and multi-junction thermocouples for maximum longevity. Proven products and proven performance are the result of the dedicated, professional people who produce and service your products.

In our state-of-the-art production facilities, extraordinary care is taken to ensure every instrument is manufactured with the highest degree of quality. Instruments are tested and calibrated against exacting standards before they leave our ISO 9002-certified facilities in Fremont, California or Rome, Italy.

BASF is committed to providing innovative designs, exceptional quality, rapid deliveries and competitive pricing. Contact a technical specialist today for recommendations about your unique needs, including made-to-order, custom-designed thermocouple assemblies – our specialty.

Calibration services

Each profile thermocouple is supplied with a calibration report traceable to national standards laboratories and conforming with the latest national and international specifications and criteria. Periodic recalibration and certification on a six-month cycle is good practice, particularly in applications subject to rigorous quality-assurance requirements. BASF will automatically notify customers of recalibration due-dates upon request.

BASF precious metal thermocouple calibration codes:

<table>
<thead>
<tr>
<th>Wire type</th>
<th>Description</th>
<th>Temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Pt vs Pt 13 Rh</td>
<td>400° to 1400°C</td>
</tr>
<tr>
<td>S</td>
<td>Pt vs Pt 10 Rh</td>
<td>400° to 1400°C</td>
</tr>
<tr>
<td>B</td>
<td>Pt 6 Rh vs Pt 30 Rh</td>
<td>800° to 1600°C</td>
</tr>
<tr>
<td>Platinel®</td>
<td>0° to 1300°C</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Chromel-Alumel®</td>
<td>Low Temp</td>
</tr>
</tbody>
</table>

Reparations

Profile thermocouples suffer occasional deterioration and breakage during normal use. Sheath deviation or excessive grain growth of the wire may occur, weakening the wire which leads to broken conductors. Sheath deterioration affects the entire assembly, and promotes early breakage. BASF undertakes a comprehensive, quick repair and modification service, generally conducted in conjunction with recalibration.

Repair code: BASF undertakes comprehensive, quick repair and modification service, generally conducted in conjunction with recalibration.

Profile thermocouple termination codes:

CODE XLR Multi-junction profile – for use with up to six elements. Available with an ISA K T/C mounted in the transition to monitor overheating.

CODE PM/FT Fixed mini connector tri-junction

CODE PVO Standard size fixed connector tri-junction

CODE CI Tri-junction with strain relief. Available with an ISA K T/C mounted in the transition to monitor overheating – add “K” to code (CI/K) if applicable.

CODE PAF Furnace adapter

CODE BM Flexible sleeve tri-junction with no sheath – shaft collar optional

Profile thermocouple and control spike assemblies

Typical profile thermocouple and control spike assemblies

To order standard designs, please specify the model number according to the following specifications. Please contact us for assistance with custom configurations.

Profile thermocouples

Ordering code no: P

Junction spacing: 6

Legend:

1. Sheath diameter code: 1 = 125”, 4 = 093”, 7 = 180”/.250”, 4 bore
2. Diameter range code: S = 0.017”, 17 = 0.020”, 20 = 0.023”, 23 = 0.025”
3. Calibrator code: S = Pt vs Pt 10 Rh, 10 = Pt 6 Rh vs Pt 30 Rh, B = Pt 6 Rh vs Pt 30 Rh, K = Alumel
4. Wires: Out = Long, In = Short, 0” = none
5. Termination code: S = Standard, P = Plug, PA = Adapter
6. Size diameter code: A = 8x12/8x10mm, C = 8x12mm, E = 4x6mm, G = 10x12mm
7. Sheath material code: Q = Quartz, S = Sandblasted Quartz, N = None
8. Active length code: 3 = 187”, 6 = 070”/.120” Oval, 9 = 250” 8 bore
9. Ceramic diameter code: 1 = 125”, 4 = 093”, 7 = 180”/.250”, 4 bore
10. Spacing of junctions: 0” to 1300”, 1” to 155”, 2” to 307”, 3” to 610”, 4” to 1220”, 5” to 2440”, 6” to 4880”, 7” to 9720”, 8” to 19440”
11. Junctions code: E = Exposed, R = Recessed, W = Wedge Tip
12. Calibration code: B = Pt 6 Rh vs Pt 30 Rh, K = Alumel

Junction codes for profile thermocouples and control spikes:

CODE E Exposed – provides maximum response characteristics for any set of circumstances

CODE R Recessed

CODE W Wedged

Control spikes

Ordering code no: C

Legend:

1. Sheath diameter code: 1 = 125”, 4 = 093”, 7 = 180”/.250”, 4 bore
2. Diameter range code: S = 0.017”, 17 = 0.020”, 20 = 0.023”, 23 = 0.025”
3. Active length code: 3 = 72”, 6 = 240” 8 bore
4. Termination code: S = Standard, P = Plug

Note: Once sheath and dimensions are fixed, then BASF will customise drawing according to specifications.

Example:

8 Termination code: B = Bare wire P = Plug
5 Ceramic diameter code:  1 = 125” 4 = 093” 7 = 180”/.250” 4 bore
4 Active length code: inches
3 = 187” 6 = 070”/.120” Oval 9 = 250” 8 bore
2 Diameter range code: S = 0.017” 17 = 0.020” 20 = 0.023” 23 = 0.025”
1 Number of junctions

Legend:

CODE E

CODE R

CODE W

Steel collar – adjustable

ACCOMODATES UP TO 12mm O.D. SHEATH

OR OVAL CERAMIC I PC. 6 BORE CERAMIC
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BASF precious metal thermocouple calibration codes:

- **R**: Pt vs Pt 13 Rh
- **S**: Pt vs Pt 10 Rh
- **B**: Pt 6 Rh vs Pt 30 Rh
- **Pt**: Platina®
- **K**: Chromel-Alumel®

Temperature range

- 400° to 1400°C
- 800° to 1600°C
- 0° to 1300°C

Calibration codes:

- **S**: Pt vs Pt 10 Rh
- **B**: Pt 6 Rh vs Pt 30 Rh
- **K**: Chromel-Alumel®

BASF precious metal thermocouple termination codes:

- **CODE C**: Furnace adapter
- **CODE E**: Exposed – provides maximum response characteristics for any set of circumstances
- **CODE R**: Recessed
- **CODE W**: Wedged

Control spikes

- **CODE C**: Tri-junction with strain relief. Available with an ISA K T/C mounted in the transition to monitor overheating – add “K” to code (CK/l) if applicable.
- **CODE PA**: Furnace adapter
- **CODE BM**: Flex-sleeve tri-junction with no sheath – shaft collar optional

Profile thermocouple termination codes:

- **CODE XL**: Multi-junction profile – for use with up to six elements. Available with an ISA K T/C mounted in the transition to monitor overheating.
- **CODE PM**: Fixed mini connector tri-junction
- **CODE RV**: Standard size fixed connector tri-junction

Junction codes for profile thermocouples and control spikes:

- **CODE E**: Exposed
- **CODE R**: Recessed
- **CODE W**: Wedged

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Precious metals expertise

Metals – particularly those in the platinum group – are critical components of many products made by BASF such as contact thermocouples. Ensuring that those raw materials are where they need to be, when they need to be there, in the form they need to be and at the lowest possible cost is what BASF’s Materials Services group is all about. Given our unique understanding of market fundamentals, such as current and future supply, technology changes and market risks, we help ensure that BASF and our customers have a cost-effective, reliable supply of the raw materials they need.

A fundamental understanding of precious metal and precious metal technologies is also critical. The experience of our research and development group in precious metal and precious metal technologies is unmatched. From Fibro® platinum to Platinel® thermocouple wire we have led the industry with breakthrough innovations. No one knows more about precious metals. We are the precious metal experts.

About us

BASF’s Catalysts division is the world’s leading supplier of environmental and process catalysts. The group offers exceptional expertise in the development of technologies that protect the air we breathe, produce the fuels that power our world and ensure efficient production of a wide variety of chemicals, plastics and other products, including advanced battery materials. By leveraging our industry-leading R&D platforms, passion for innovation and deep knowledge of precious and base metals, BASF’s Catalysts division develops unique, proprietary solutions that drive customer success.

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