



Temperature management by design

INTERNATIONAL THERMOCOUPLE COLOUR CODES

| | Japanese to JIS C1610-1981 | International IEC 584-3 | British to BS1843 | USA/Canadian to ANSI | Alloy Combination | | Limits of Error (Whichever is Greater) | | Maximum Useful Temperature Range |
|----------|---------------------------------------|-------------------------|-----------------------------|----------------------|---------------------------------|-----------------------------------|---|------------------|--|
| | | | | | + Lead | - Lead | Standard | Special | |
| J | | | | | IRON Fe (magnetic) | CONSTANTAN COPPER-NICKEL CU-NI | 2.2°C or 0.75% | 1.1°C or 0.4% | 0 to 750°C Thermocouple Grade 0 to 200°C Extension Grade |
| K | | | | | NICKEL-CHROMIUM Ni-Cr | NICKEL-ALUMINIUM Ni-Al (magnetic) | 2.2°C or 0.75% Above 0°C 2.2°C or 2.0% Below 0°C | 1.1°C or 0.4% | -200 to 1290°C Thermocouple Grade 0 to 200°C Extension Grade |
| V | | | | NONE ESTABLISHED | COPPER Cu | CONSTANTAN COPPER-NICKEL CU-NI | | | -0 to 80°C Extension Grade |
| T | | | | | COPPER Cu | CONSTANTAN COPPER-NICKEL CU-NI | 1.0°C or 0.75% Above 0°C 1.0°C or 1.5% Below 0°C | 0.5°C or 0.4% | -250 to 300°C Thermocouple Grade -60 to 100°C Extension Grade |
| E | | | | | NICKEL-CHROMIUM Ni-Cr | CONSTANTAN COPPER-NICKEL CU-NI | 1.7°C or 0.5% Above 0°C 1.7°C or 1.0% Below 0°C | 1.0°C or 0.4% | -200 to 900°C Thermocouple Grade 0 to 200°C Extension Grade |
| N | NO STANDARD USE AMERICAN COLOUR CODES | | | | Ni-Cr-Si | Ni-Si-Mg | 2.2°C or 0.75% Above 0°C 2.2°C or 2.0% Below 0°C | 1.1°C or 0.4% | -270 to 1300°C Thermocouple Grade 0 to 200°C Extension Grade |
| R | | | | | PLATINIUM 13% RHODIUM Pt-13% Rh | PLATINIUM Pt | 1.5°C or 0.25% | 0.6°C or 0.1% | 0 to 1450°C Thermocouple Grade 0 to 150°C Extension Grade |
| S | | | | | PLATINIUM 10% RHODIUM Pt-10% Rh | PLATINIUM Pt | 1.5°C or 0.25% | 0.6°C or 0.1% | 0 to 1400°C Thermocouple Grade 0 to 150°C Extension Grade |
| U | | | | | COPPER Cu | COPPER LOW NICKEL Cu-Ni | | | 0 to 50°C Extension Grade |
| B | | | NO STANDARD USE COPPER WIRE | | PLATINIUM 30% RHODIUM Pt-30% Rh | PLATINIUM 6% RHODIUM Pt-6% Rh | 0.5% over 800°C | NONE ESTABLISHED | 0 to 1700°C Thermocouple Grade 0 to 100°C Extension Grade |

Thermocouple & RTD Wire Insulation

| Insulation Material | Service Temperature | Oil, Acid, Alkali Weather Res. | Abrasion Resistance | Moisture Resistance | Insulation Resistance | Notes |
|---------------------|---------------------|--------------------------------|---------------------|---------------------|-----------------------|------------------------------|
| PVC | 105°C | Excellent | Good | Excellent | Excellent | Std. temp. 80°C |
| Rubber | 100°C | Good | Excellent | Excellent | Excellent | Good in smoke |
| Silicone | 150°C | Fair | Poor | Excellent | Excellent | Autoclaves |
| *Teflon FEP | 215°C | Excellent | Excellent | Good | Excellent | Tough, but difficult to seal |
| *Teflon PFA | 250°C | Excellent | Excellent | Good | Excellent | |
| *Teflon TFE | 260°C | Excellent | Excellent | Good | Excellent | |
| Glass GBF | 350°C | Poor | Fair | Poor | Fair | Overbraided |
| Glass SBF | 700°C | Poor | Fair | Poor | Fair | Overbraided |
| Ceramic CBF | 1200°C | Fair | Fair | Poor | Fair | V. High Temp. |

* Registered Trademark of E I DuPont Inc.

