

## E-TYPE

### 補償導線 E-TYPE / 热電対 でんつい

### Thermocouple E-TYPE

#### 適用領域 / Product Application

工業用熱電偶中，熱電動勢值最高的一種。近期需求急速增加，大型火力及核能發電廠均採用。正極之鎳、鉻合金與「K型熱電偶」同有 Green-Rot 之現象，使用時宜採取相似之措施。其電阻較大，應慎選計器使用。

E-Type industrial thermocouple has the highest thermal EMF among all. It's commonly used in large-scale fossil fuels and nuclear power plants. It has a greater resistance compared to other types of thermocouples and it should be carefully selected on field of application.



美規 - 補償導線等級  
US Thermocouple Grade



日規 JIS C 1610-1981  
Japanese



美規 - 延伸等級  
US Extension Grade



國際等級 IEC 584-3  
International

#### 技術資料 / TECHNICAL DATA

種類 Material	適用溫度 Temp Range	耐燃性 Flame Retardant	耐磨性 Friction Resist.	耐油性 Oil Resist.	耐酸鹼性 Chemical Resist.	耐濕性 Waterproof	可繞性 Flexibility
塑膠 PVC	-10 ~ 105C	Bad	Good	Bad	Fair	Good	Excellent
橡膠 EPR/HYP Rubber	-15 ~ 110C	Bad	Good	Good	Good	Good	Excellent
矽膠 Silicone	-60 ~ 200C	Good	Good	Excellent	Excellent	Excellent	Excellent
矽膠 Silicone Waker 750	-60 ~ 300C	Good	Good	Excellent	Excellent	Excellent	Excellent
鐵氟龍 Teflon FEP	-100 ~ 200C	Excellent	Excellent	Excellent	Excellent	Excellent	Good
鐵氟龍 Teflon PFA	-267 ~ 260C	Excellent	Excellent	Excellent	Excellent	Excellent	Good
KAPTON	-267 ~ 316C	Good	Good	Good	Good	Fair	Fair
玻璃纖維 Fiberglass	-100 ~ 500C	Excellent	Fair	Fair	Excellent	Bad	Fair
二氧化矽玻璃纖維 Fiberglass	-100 ~ 710C	Excellent	Fair	Fair	Excellent	Bad	Fair
耐高溫陶瓷纖維 Ceramic Fiber	-100 ~ 1200C	Excellent	Bad	Fair	Excellent	Bad	Fair

#### 縮寫對照表 / ABBREVIATION GUIDE

絕緣體縮寫表			導體縮寫表		
中文	English	Abbreviation	中文	English	Abbreviation
塑膠	PVC	P	無氧銅	Oxygen-Free Copper	OFC
橡膠	EPR/HYP Rubber	R	銅鎳合金	Ni-Copper	Ni-Cu
矽膠	Silicone Rubber	S	鎳鉻合金	Nickel-Chromium	Ni-Cr
鐵氟龍	Teflon FEP	T	鎳鋁合金	Nickel-Alumel	Ni-Al
鐵氟龍	Teflon PFA	T	鐵	Iron	Iron/Fe
KAPTON	KAPTON/Polymide	K	鍍錫銅	Tinned Copper	Tc
玻璃纖維	Fiberglass	G	不鏽鋼	Stainless Steel	SUS304
耐高溫陶瓷纖維	Ceramic Fiber	C			
雲母	Mica	M			

代號 Wire Code	規格 Specification	線徑 Dimension		絕緣材質 Insulation Material	導體材質 Conductor Material		環境溫度 Temp. Range	米 / 卷 Mt / Coils
		ID (mm)	OD (mm) H x L		正極 (+)	負極 (-)		
PP-EC-22S	0.3/4 x 2 (22 AWG)	1.45	2.60 x 3.80	PVC	Chromel Ni-Cr	Ni-Cu	0 ~ 105C	200
PP-EC-20S	0.3/7 x 2 (20 AWG)	1.50	2.60 x 3.80	PVC	Chromel Ni-Cr	Ni-Cu	0 ~ 105C	200
PP-EC-16S	0.6/4 x 2 (16 AWG)	2.45	4.40 x 6.70	PVC	Chromel Ni-Cr	Ni-Cu	0 ~ 105C	200
PP-EC-14S	0.6/7 x 2 (14 AWG)	3.00	4.55 x 7.65	PVC	Chromel Ni-Cr	Ni-Cu	0 ~ 105C	200
PSP-EC-14S	0.6/7 x 2 (14 AWG)	3.00	4.90 x 7.80	PVC-SUS304	Chromel Ni-Cr	Ni-Cu	0 ~ 105C	200
SPP-EC-14S	0.6/7 x 2 (14 AWG)	3.00	5.80 x 8.20	PVC-SUS304	Chromel Ni-Cr	Ni-Cu	0 ~ 105C	200
GG-EX-28	0.3 x 2 (28 AWG)	0.75	1.40 x 2.50	玻璃纖維 Fiberglass	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
GG-EX-22	0.6 x 2 (22 AWG)	1.10	2.00 x 3.20	玻璃纖維 Fiberglass	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
GG-EX-22S	0.3/4 x 2 (22 AWG)	1.20	2.05 x 3.30	玻璃纖維 Fiberglass	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
GG-EX-20S	0.3/7 x 2 (20 AWG)	1.50	2.00 x 3.50	玻璃纖維 Fiberglass	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
GG-EX-16S	0.6/4 x 2 (16 AWG)	2.15	2.90 x 4.60	玻璃纖維 Fiberglass	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
GG-EX-14S	0.6/7 x 2 (14 AWG)	2.40	3.30 x 5.20	玻璃纖維 Fiberglass	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
SGG-EX-24	0.5 x 2 (24 AWG)	1.00	1.65 x 2.85	玻璃纖維 - 不鏽鋼網 Fiberglass-SUS304	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
SGG-EX-22	0.6 x 2 (22 AWG)	1.10	1.75 x 2.95	玻璃纖維 - 不鏽鋼網 Fiberglass-SUS305	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
SGG-EX-22S	0.3/4 x 2 (22 AWG)	1.20	1.80 x 3.05	玻璃纖維 - 不鏽鋼網 Fiberglass-SUS306	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
HH-E-36	0.127 x 2 (36 AWG)	0.50	0.95 x 1.45	二氧化矽玻璃纖維 Silica Fiber	Chromel Ni-Cr	Ni-Cu	0 ~ 710C	200
HH-E-30	0.254 x 2 (30 AWG)	0.65	1.10 x 1.55	二氧化矽玻璃纖維 Silica Fiber	Chromel Ni-Cr	Ni-Cu	0 ~ 710C	200
HH-E-24	0.5 x 2 (24 AWG)	1.00	1.20 x 1.90	二氧化矽玻璃纖維 Silica Fiber	Chromel Ni-Cr	Ni-Cu	0 ~ 710C	200
HH-E-22	0.6 x 2 (22 AWG)	1.10	1.70 x 2.70	二氧化矽玻璃纖維 Silica Fiber	Chromel Ni-Cr	Ni-Cu	0 ~ 710C	200
HH-E-20	0.8 x 2 (20 AWG)	1.30	1.75 x 2.75	二氧化矽玻璃纖維 Silica Fiber	Chromel Ni-Cr	Ni-Cu	0 ~ 710C	200
CC-E-24	0.5 x 2 (24 AWG)	1.00	1.20 x 1.90	陶瓷纖維 Ceramics Fiber	Chromel Ni-Cr	Ni-Cu	0 ~ 1200C	200
CC-E-20	0.8 x 2 (20 AWG)	1.30	1.75 x 2.75	陶瓷纖維 Ceramics Fiber	Chromel Ni-Cr	Ni-Cu	0 ~ 1200C	200
TT-EX-36	0.127 x 2 (36 AWG)	0.29	0.42 x 0.75	鐵氟龍 Teflon	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
TT-EX-28	0.3 x 2 (28 AWG)	0.65	1.20 x 1.80	鐵氟龍 Teflon	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
TT-EX-24	0.5 x 2 (24 AWG)	0.85	1.20 x 1.85	鐵氟龍 Teflon	Chromel Ni-Cr	Ni-Cu	1 ~ 200C	200
TT-EX-22	0.6 x 2 (22 AWG)	1.05	1.60 x 2.70	鐵氟龍 Teflon	Chromel Ni-Cr	Ni-Cu	0 ~ 200C	200
KK-E-24 KK-E-24S	0.5 x 2 (24 AWG) 0.2/7 x 2 (24 AWG)	1.00	1.20 x 2.20	KAPTON	Chromel Ni-Cr	Ni-Cu	0 ~ 400C	200

# ANSI and IEC Color Codes

## For Thermocouples, Wire and Connectors

補償導線國際色規 / 各国規格による補償導線カラーコード

All NIZING® Thermocouple Wire, Probes and Connectors are available with either ANSI or IEC Color Codes.



### 補 償 導 線

ANSI Code	Comments Environment- Bare Wire	Color Coding		International IEC 584-3	International IEC 584-3 Intrinsically Safe	CZECH British to BS 1843	Netherlands German to DIN 43710	Japanese to JIS C 1610- 1981	French to NFE-18801
		Thermocouple Grade	Extension Grade						
J	Reducing Vacuum, Inert. Limited Use in Oxidizing at High Temperatures. Not Recommended for Low Temperatures.								
K	Clean Oxidizing and Inert. Limited use in Vacuum or Reducing. Wide Temperature Range. Most Popular Calibration.								
V'	Alternative to KX Type Extension Wire for Low Temperature. Not Recommended for General Use.	None Established	None Established						
T	Mid Oxidizing, Reducing Vacuum or Insert. Good Where Moisture is Present Low Temperature and Cryogenic Applications.								
E	Oxidizing or Inert. Limited Use in Vacuum or Reducing Highest EMF Change Per Degree								
N	Alternative to Type K More stable at High Temperature						No Standard Use American Color Code		
R	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of contamination. High Temperature	None Established							
S	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature	None Established							
U'	Extension Guide Connecting Wire for R and S Thermocouples Also Known as RX and SX Extension Wire	None Established							
B	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature. Common Use in Glass Industry.	None Established					No Color Standard		
G' (W)	Vacuum, Inert, Hydrogen. Beware of Embrittlement Not Practical Below 399°C (750°F)Not for Oxidizing Atmosphere.	None Established					No Standard Use American Color Code		
C' (W5)	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F)Not for Oxidizing Atmosphere.	None Established					No Standard Use American Color Code		
D' (W3)	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F)Not for Oxidizing Atmosphere.	None Established					No Standard Use American Color Code		