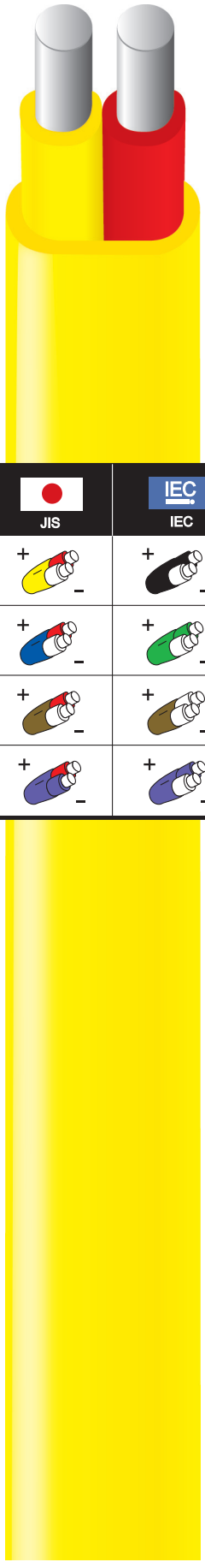
Thermocouple Wire



Application

A thermocouple is a temperature measuring device consisting of two conductors of dissimilar metals or alloys that are connected only at the ends. When the ends are at different temperatures, a small voltage is produced in the wire that can be related directly to the temperature difference between the ends. If the temperature at one end is known, the temperature at the other end can be determined.

Thermocouple wire or extension grade wire is recommended to be used to connect thermocouples to the sensing or control instrumentation. The conditions of measurement determine the type of thermocouple wire and insulation to be used. Temperature range, environment, insulation requirements, response, and service life should be considered.

Color Code

Thermocouple Extension Type	ANSI	BS	DIN	NFC	JIS	IEC
JX +Iron -Constantan	+ −	+ −	+ −	+ −	+ −	+ −
KX +Chromel -Alumel	+ −	+ −	+ −	+ −	+ −	+ −
TX +Copper -Constantan	+ −	+ −	+ −	+ −	+ −	+ −
EX +Chromel -Constantan	+ −	+ −	+ −	+ −	+ −	+ −

Calibration Type Characteristics

TYPE J (Iron vs Constantan) is used in vacuum, oxidizing, inert or reducing atmospheres. Iron element oxidizes rapidly at temperatures exceeding 538℃, and therefore heavier gauge wire is recommended for longer life at these temperatures.

TYPE K (Chromel vs Alumel) is used in oxidizing, inert or dry reducing atmospheres. Exposure to vacuum limited to short time periods. Must be protected from sulfurous and marginally oxidizing atmospheres. Reliable and accurate at high temperatures.

TYPE T (Copper vs Constantan) is used or service in oxidizing, inert or reducing atmospheres or in vacuum. It is highly resistant to corrosion from atmospheric moisture and condensation and exhibits high stability at low temperatures. It is the only type with limits of error guaranteed for cryogenic temperatures.

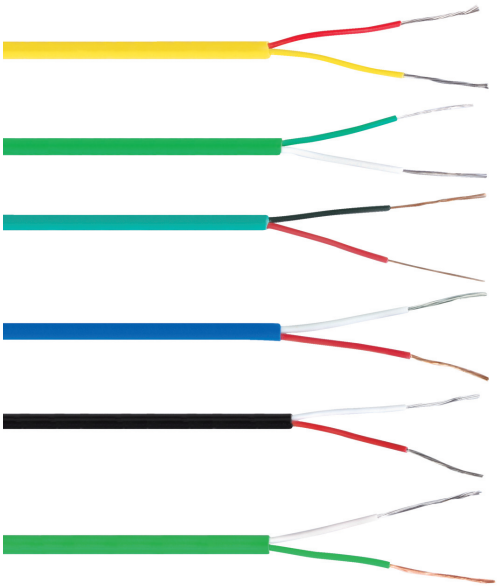
TYPE E (Chromel vs Constantan) may be used in oxidizing, inert or dry reducing atmospheres, or for short periods of time under vacuum. Must be protected from sulfurous and marginally oxidizing atmospheres. Produces the highest EMF per degree of any standardized thermocouple.

ZONZEN

PVC Insulated Thermocouple & Extension Wire (PVC-PVC)

Specification

- Conductor calibration: K, J, E, T
- Conductor insulation: PVC
- Jacket insulation: PVC
- Construction: Parallel conductor
- Max. temp.: 105℃
- Color code: ANSI, IEC & JIS



Model Explanation

K ① - PVC ② - SSB ③ - PVC ④ - SSB ⑤ - 20 ⑥ S ⑦

① Calibration: K, J, T, E
② Conductor insulation material: PVC
③ Inner shield material: SSB
④ Jacket insulation material: PVC
⑤ Outer shield material: SSB
⑥ Wire size (AWG)
⑦ "S" means "Stranded"; "Blank" means "Solid"

Order Code

Wire Grade	Wire Size (AWG)	Wire Type	Calibration			
			Type J	Type K	Type T	Type E
Thermocouple	16	Solid	J-PVC-PVC-16	K-PVC-PVC-16	T-PVC-PVC-16	E-PVC-PVC-16
	16 7/24	Stranded	J-PVC-PVC-16S	K-PVC-PVC-16S	T-PVC-PVC-16S	E-PVC-PVC-16S
	20	Solid	J-PVC-PVC-20	K-PVC-PVC-20	T-PVC-PVC-20	E-PVC-PVC-20
	20 7/28	Stranded	J-PVC-PVC-20S	K-PVC-PVC-20S	T-PVC-PVC-20S	E-PVC-PVC-20S
	24	Solid	J-PVC-PVC-24	K-PVC-PVC-24	T-PVC-PVC-24	E-PVC-PVC-24
	24 7/32	Stranded	J-PVC-PVC-24S	K-PVC-PVC-24S	T-PVC-PVC-24S	E-PVC-PVC-24S
Extension	14	Solid	JX-PVC-PVC-14	KX-PVC-PVC-14	TX-PVC-PVC-14	EX-PVC-PVC-14
	16	Solid	JX-PVC-PVC-16	KX-PVC-PVC-16	TX-PVC-PVC-16	EX-PVC-PVC-16
	16 7/24	Stranded	JX-PVC-PVC-16S	KX-PVC-PVC-16S	TX-PVC-PVC-16S	EX-PVC-PVC-16S
	18 7/26	Stranded	JX-PVC-PVC-18S	KX-PVC-PVC-18S	TX-PVC-PVC-18S	EX-PVC-PVC-18S
	20	Solid	JX-PVC-PVC-20	KX-PVC-PVC-20	TX-PVC-PVC-20	EX-PVC-PVC-20
	20 7/28	Stranded	JX-PVC-PVC-20S	KX-PVC-PVC-20S	TX-PVC-PVC-20S	EX-PVC-PVC-20S
	24	Solid	JX-PVC-PVC-24	KX-PVC-PVC-24	TX-PVC-PVC-24	EX-PVC-PVC-24
	24 7/32	Stranded	JX-PVC-PVC-24S	KX-PVC-PVC-24S	TX-PVC-PVC-24S	EX-PVC-PVC-24S

Note: The above order codes represent the more popular constructions. However, other designs are available upon request.

Inner Shield

All above thermocouple and extension wire can be finished with a inner shield (Stainless steel-SSB), If you need the wire with a inner shield, please add "**SSB**" to the order code, such as "**JX-PVC-SSB-PVC-20S**", it means Type JX, 20AWG, Stranded, Conductor insulation: PVC, Inner shield: Stainless steel, Jacket insulation: PVC.

Outer Shield

All above thermocouple and extension wire also can be finished with a metal outer shield to give added protection from abrasion and mechanical damage. If you need the wire with a outer shield, please add "**SSB**" to the order code, such as "**JX-PVC-PVC-SSB-20S**", it means Type JX, 20AWG, Stranded, Conductor insulation: PVC, Jacket insulation: PVC, Outer shield: Stainless steel.



PVC Insulated Thermocouple & Extension Wire (PVC-PVC)

Color Code & Initial Calibration Tolerance for Thermocouple Wire

Thermocouple Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	J	White/Red	Brown	0℃ to +285℃ 285℃ to +750℃	±2.2℃ ± .75%	±1.1℃ ± .4%
Chromel(+) vs. Alumel(-)	K	Yellow/Red	Brown	-200℃ to -110℃ -110℃ to 0℃ 0℃ to +285℃ 285℃ to +1250℃	± 2% ±2.2℃ ±2.2℃ ± .75%	 ±1.1℃ ± .4%
Copper(+) vs. Constantan(-)	T	Blue/Red	Brown	-200℃ to -65℃ -65℃ to +130℃ 130℃ to +350℃	± 1.5% ±1℃ ± .75%	± .8% ± .5℃ ± .4%
Chromel(+) vs. Constantan(-)	E	Purple/Red	Brown	-200℃ to -170℃ -170℃ to +250℃ 250℃ to +340℃ 340℃ to +900℃	± 1% ±1.7℃ ±1.7℃ ± .5%	±1℃ ±1℃ ± .4% ± .4%

Color Code & Initial Calibration Tolerance for Extension Wire

Extension Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	JX	White/Red	Black	0℃ to +200℃	±2.2℃	±1.1℃
Chromel(+) vs. Alumel(-)	KX	Yellow/Red	Yellow	0℃ to +200℃	±2.2℃	±1.1℃
Copper(+) vs. Constantan(-)	TX	Blue/Red	Blue	-60℃ to +100℃	±1.1℃	± .5℃
Chromel(+) vs. Constantan(-)	EX	Purple/Red	Purple	0℃ to +200℃	±1.7℃	±1.1℃

Nominal Insulation Thickness

Wire Size (AWG)	Conductor Insulation Thickness (mm)	Jacket Insulation Thickness (mm)	Outer Diameter (mm)
14	0.38	0.45	3.2×5.6
16	0.38	0.38	2.8×4.9
16 7/24	0.38	0.38	3.0×5.0
20	0.38	0.38	2.3×3.9
20 7/28	0.38	0.38	2.4×4.1
24	0.38	0.38	2.0×3.3
24 7/32	0.38	0.38	2.1×3.5

PVC-PVC Physical Properties

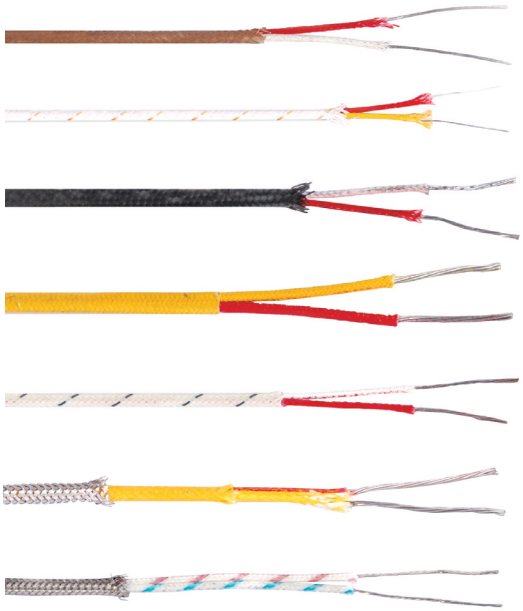
Characteristics	Insulation	Jacket
Abrasion Resistance	Good	Good
Cut Through Resistance	Good	Good
Moisture Resistance	Excellent	Excellent
Solder Iron Resistance	Poor	Poor
Service Temperature	105℃ continuous 150℃ single	105℃ continuous 150℃ single
Flame Test	Self-extinguishing	Self-extinguishing

ZONZEN

Fiberglass Braided Insulated Thermocouple & Extension Wire(FB-FB)

Specification

- Conductor calibration: K, J, E, T
- Conductor insulation: Fiberglass
- Jacket insulation: Fiberglass
- Construction: Parallel conductor
- Max. temp. : 480℃
- Color code: ANSI, IEC & JIS



Model Explanation

K - FB - SSB - FB - SSB - 20 S
① ② ③ ④ ⑤ ⑥ ⑦

① Calibration: K, J, T, E
② Conductor insulation material: Fiberglass
③ Inner shield material: SSB
④ Jacket insulation material: Fiberglass
⑤ Outer shield material: SSB
⑥ Wire size (AWG)
⑦ "S" means "Stranded"; "Blank" means "Solid"

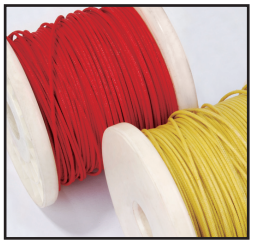
Order Code

Wire Grade	Wire Size (AWG)	Wire Type	Calibration			
			Type J	Type K	Type T	Type E
Thermocouple	14	Solid	J-FB-FB-14	K-FB-FB-14	T-FB-FB-14	E-FB-FB-14
	16	Solid	J-FB-FB-16	K-FB-FB-16	T-FB-FB-16	E-FB-FB-16
	20	Solid	J-FB-FB-20	K-FB-FB-20	T-FB-FB-20	E-FB-FB-20
	20 7 /28	Stranded	J-FB-FB-20S	K-FB-FB-20S	T-FB-FB-20S	E-FB-FB-20S
	24	Solid	J-FB-FB-24	K-FB-FB-24	T-FB-FB-24	E-FB-FB-24
	24 7 /32	Stranded	J-FB-FB-24S	K-FB-FB-24S	T-FB-FB-24S	E-FB-FB-24S
Extension	16	Solid	JX-FB-FB-16	KX-FB-FB-16	TX-FB-FB-16	EX-FB-FB-16
	20	Solid	JX-FB-FB-20	KX-FB-FB-20	TX-FB-FB-20	EX-FB-FB-20
	20 7/28	Stranded	JX-FB-FB-20S	KX-FB-FB-20S	TX-FB-FB-20S	EX-FB-FB-20S
	24	Solid	JX-FB-FB-24	KX-FB-FB-24	TX-FB-FB-24	EX-FB-FB-24
	24 7/32	Stranded	JX-FB-FB-24S	KX-FB-FB-24S	TX-FB-FB-24S	EX-FB-FB-24S

Note: The above order codes represent the more popular constructions. However, other designs are available upon request.

Outer Shield

All above thermocouple and extension wire also can be finished with a metal outer shield to give added protection from abrasion and mechanical damage. If you need the wire with a outer shield, please add "**SSB**" to the order code, such as "**JX-FB-FB-SSB-20S**", it means Type JX, 20AWG, Stranded, Conductor insulation: Fiberglass, Jacket insulation: Fiberglass, Outer shield: Stainless steel.



Fiberglass Braided Insulated Thermocouple & Extension Wire(FB-FB)

Color Code & Initial Calibration Tolerance for Thermocouple Wire

Thermocouple Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	J	White/Red	Brown	0℃ to +285℃ 285℃ to +750℃	±2.2℃ ± .75%	±1.1℃ ± .4%
Chromel(+) vs. Alumel(-)	K	Yellow/Red	Brown	-200℃ to -110℃ -110℃ to 0℃ 0℃ to +285℃ 285℃ to +1250℃	± 2% ±2.2℃ ±2.2℃ ± .75%	 ±1.1℃ ± .4%
Copper(+) vs. Constantan(-)	T	Blue/Red	Brown	-200℃ to -65℃ -65℃ to +130℃ 130℃ to +350℃	± 1.5% ±1℃ ± .75%	± .8% ± .5℃ ± .4%
Chromel(+) vs. Constantan(-)	E	Purple/Red	Brown	-200℃ to -170℃ -170℃ to +250℃ 250℃ to +340℃ 340℃ to +900℃	± 1% ±1.7℃ ±1.7℃ ± .5%	±1℃ ±1℃ ± .4% ± .4%

Color Code & Initial Calibration Tolerance for Extension Wire

Extension Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	JX	White/Red	Black	0℃ to +200℃	±2.2℃	±1.1℃
Chromel(+) vs. Alumel(-)	KX	Yellow/Red	Yellow	0℃ to +200℃	±2.2℃	±1.1℃
Copper(+) vs. Constantan(-)	TX	Blue/Red	Blue	-60℃ to +100℃	±1.1℃	± .5℃
Chromel(+) vs. Constantan(-)	EX	Purple/Red	Purple	0℃ to +200℃	±1.7℃	±1.1℃

Nominal Insulation Thickness

Wire Size (AWG)	Conductor Insulation Thickness (mm)	Jacket Insulation Thickness (mm)	Outer Diameter (mm)
14	0.18	0.25	2.5×4.6
16	0.18	0.25	2.2×3.8
16 7/24	0.18	0.25	2.4×4.3
20	0.15	0.15	1.4×2.5
20 7/28	0.15	0.15	1.5×2.7
24	0.15	0.15	1.0×1.7
24 7/32	0.15	0.15	1.2×2.1

FB-FB Physical Properties

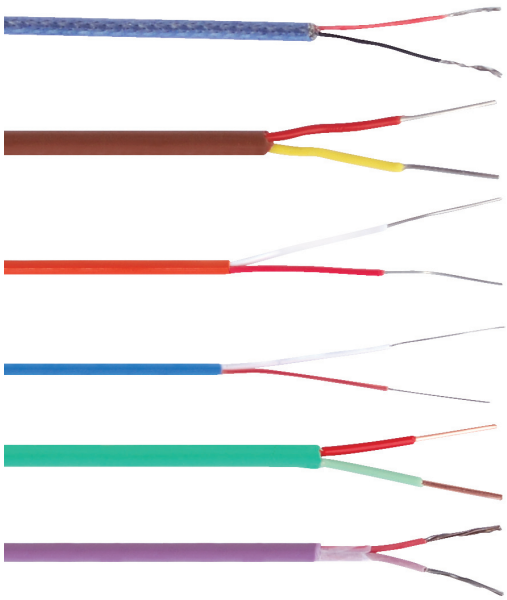
Characteristics	Insulation	Jacket
Abrasion Resistance	Good	Good
Cut Through Resistance	Very good	Excellent
Moisture Resistance	Good	Good
Solder Iron Resistance	Excellent	Excellent
Service Temperature	480℃ continuous 537℃ single	480℃ continuous 537℃ single
Flame Test	Non-flammable	Non-flammable

ZONZEN

FEP Insulated Thermocouple & Extension Wire (FEP-FEP)

Specification

- Conductor calibration: K, J, E, T
- Conductor insulation: FEP
- Jacket insulation: FEP
- Construction: Parallel conductor
- Max. temp. : 200℃
- Color code: ANSI, IEC & JIS



Model Explanation

K - FEP - SSB - FEP - SSB - 20 S
① ② ③ ④ ⑤ ⑥ ⑦

① Calibration: K, J, T, E
② Conductor insulation material: FEP
③ Inner shield material: SSB
④ Jacket insulation material: FEP
⑤ Outer shield material: SSB
⑥ Wire size (AWG)
⑦ "S" means "Stranded"; "Blank" means "Solid"

Order Code

Wire Grade	Wire Size (AWG)	Wire Type	Calibration			
			Type J	Type K	Type T	Type E
Thermocouple	20	Solid	J-FEP-FEP-20	K-FEP-FEP-20	T-FEP-FEP-20	E-FEP-FEP-20
	20 7/28	Stranded	J-FEP-FEP-20S	K-FEP-FEP-20S	T-FEP-FEP-20S	E-FEP-FEP-20S
	24	Solid	J-FEP-FEP-24	K-FEP-FEP-24	T-FEP-FEP-24	E-FEP-FEP-24
	24 7/32	Stranded	J-FEP-FEP-24S	K-FEP-FEP-24S	T-FEP-FEP-24S	E-FEP-FEP-24S
	30	Solid	J-FEP-FEP-30	K-FEP-FEP-30	T-FEP-FEP-30	E-FEP-FEP-30
Extension	16	Solid	JX-FEP-FEP-16	KX-FEP-FEP-16	TX-FEP-FEP-16	EX-FEP-FEP-16
	20	Solid	JX-FEP-FEP-20	KX-FEP-FEP-20	TX-FEP-FEP-20	EX-FEP-FEP-20
	20 7/28	Stranded	JX-FEP-FEP-20S	KX-FEP-FEP-20S	TX-FEP-FEP-20S	EX-FEP-FEP-20S
	24	Solid	JX-FEP-FEP-24	KX-FEP-FEP-24	TX-FEP-FEP-24	EX-FEP-FEP-24
	24 7/32	Stranded	JX-FEP-FEP-24S	KX-FEP-FEP-24S	TX-FEP-FEP-24S	EX-FEP-FEP-24S

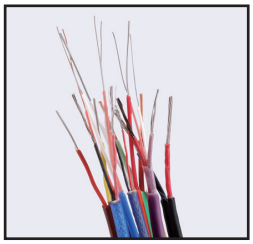
Note: The above order codes represent the more popular constructions. However, other designs are available upon request.

Inner Shield

All above thermocouple and extension wire can be finished with a inner shield (Stainless steel-SSB), If you need the wire with a inner shield, please add "**SSB**" to the order code, such as "**JX-FEP-SSB-FEP-20S**", it means Type JX, 20AWG, Stranded, Conductor insulation: FEP, Inner shield: Stainless steel, Jacket insulation: FEP.

Outer Shield

All above thermocouple and extension wire also can be finished with a metal outer shield to give added protection from abrasion and mechanical damage. If you need the wire with a outer shield, please add "**SSB**" to the order code, such as "**JX-FEP-FEP-SSB-20S**", it means Type JX, 20AWG, Stranded, Conductor insulation: FEP, Jacket insulation: FEP, Outer shield: Stainless steel.



FEP Insulated Thermocouple & Extension Wire (FEP-FEP)

Color Code & Initial Calibration Tolerance for Thermocouple Wire

Thermocouple Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	J	White/Red	Brown	0℃ to +285℃ 285℃ to +750℃	±2.2℃ ± .75%	±1.1℃ ± .4%
Chromel(+) vs. Alumel(-)	K	Yellow/Red	Brown	-200℃ to -110℃ -110℃ to 0℃ 0℃ to +285℃ 285℃ to +1250℃	± 2% ±2.2℃ ±2.2℃ ± .75%	 ±1.1℃ ± .4%
Copper(+) vs. Constantan(-)	T	Blue/Red	Brown	-200℃ to -65℃ -65℃ to +130℃ 130℃ to +350℃	± 1.5% ±1℃ ± .75%	± .8% ± .5℃ ± .4%
Chromel(+) vs. Constantan(-)	E	Purple/Red	Brown	-200℃ to -170℃ -170℃ to +250℃ 250℃ to +340℃ 340℃ to +900℃	± 1% ±1.7℃ ±1.7℃ ± .5%	±1℃ ±1℃ ± .4% ± .4%

Color Code & Initial Calibration Tolerance for Extension Wire

Extension Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	JX	White/Red	Black	0℃ to +200℃	±2.2℃	±1.1℃
Chromel(+) vs. Alumel(-)	KX	Yellow/Red	Yellow	0℃ to +200℃	±2.2℃	±1.1℃
Copper(+) vs. Constantan(-)	TX	Blue/Red	Blue	-60℃ to +100℃	±1.1℃	± .5℃
Chromel(+) vs. Constantan(-)	EX	Purple/Red	Purple	0℃ to +200℃	±1.7℃	±1.1℃

Nominal Insulation Thickness

Wire Size (AWG)	Conductor Insulation Thickness (mm)	Jacket Insulation Thickness (mm)	Outer Diameter (mm)
14	0.20	0.25	2.6×4.8
16	0.20	0.25	2.2×3.9
16 7/24	0.20	0.25	2.4×4.3
20	0.20	0.25	1.7×2.9
20 7/28	0.20	0.25	1.8×3.1
24	0.20	0.25	1.4×2.3
24 7/32	0.20	0.25	1.6×2.7

FEP-FEP Physical Properties

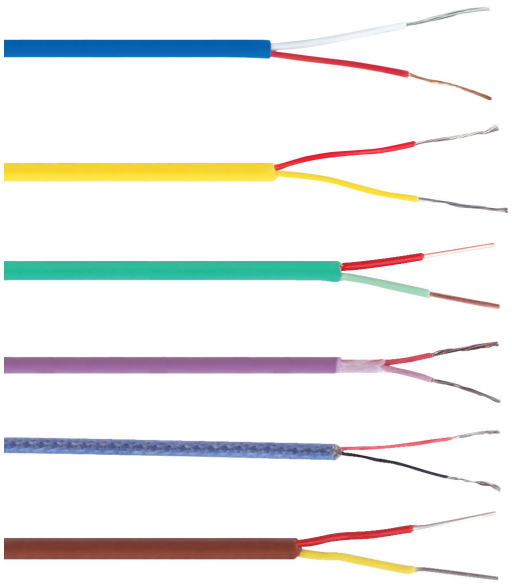
Characteristics	Insulation	Jacket
Abrasion Resistance	Very good	Very good
Cut Through Resistance	Good	Good
Moisture Resistance	Excellent	Excellent
Solder Iron Resistance	Good	Good
Service Temperature	200℃ continuous 250℃ single	200℃ continuous 250℃ single
Flame Test	Self-extinguishing	Self-extinguishing

ZONZEN

PFA Insulated Thermocouple & Extension Wire (PFA-PFA)

Specification

- Conductor calibration: K, J, E, T
- Conductor insulation: PFA
- Jacket insulation: PFA
- Construction: Parallel conductor
- Max. temp. : 260℃
- Color code: ANSI, IEC & JIS



Model Explanation

K - PFA - SSB - PFA - SSB - 20 S
① ② ③ ④ ⑤ ⑥ ⑦

① Calibration: K, J, T, E
② Conductor insulation material: PFA
③ Inner shield material: SSB
④ Jacket insulation material: PFA
⑤ Outer shield material: SSB
⑥ Wire size (AWG)
⑦ "S" means "Stranded"; "Blank" means "Solid"

Order Code

Wire Grade	Wire Size (AWG)	Wire Type	Calibration			
			Type J	Type K	Type T	Type E
Thermocouple	16	Solid	J-PFA-PFA-16	K-PFA-PFA-16	T-PFA-PFA-16	E-PFA-PFA-16
	20	Solid	J-PFA-PFA-20	K-PFA-PFA-20S	T-PFA-PFA-20S	E-PFA-PFA-20S
	20 7/28	Stranded	J-PFA-PFA-20S	K-PFA-PFA-20S	T-PFA-PFA-20S	E-PFA-PFA-20S
	22 7/30	Stranded	J-PFA-PFA-22S	K-PFA-PFA-22S	T-PFA-PFA-22S	E-PFA-PFA-22S
	24	Solid	J-PFA-PFA-24	K-PFA-PFA-24	T-PFA-PFA-24	E-PFA-PFA-24
	24 7/32	Stranded	J-PFA-PFA-24S	KX-PFA-PFA-24S	TX-PFA-PFA-24S	EX-PFA-PFA-24S
	30	Solid	J-PFA-PFA-30	KX-PFA-PFA-30	TX-PFA-PFA-30	EX-PFA-PFA-30
Extension	16	Solid	JX-PFA-PFA-16	KX-PFA-PFA-16S	TX-PFA-PFA-16S	EX-PFA-PFA-16S
	20	Solid	JX-PFA-PFA-20	KX-PFA-PFA-24	TX-PFA-PFA-24	EX-PFA-PFA-24
	20 7/28	Stranded	JX-PFA-PFA-20S	KX-PFA-PFA-24S	TX-PFA-PFA-24S	EX-PFA-PFA-24S
	24	Solid	JX-PFA-PFA-24	KX-PFA-PFA-24	TX-PFA-PFA-24	EX-PFA-PFA-24
	24 7/32	Stranded	JX-PFA-PFA-24S	KX-PFA-PFA-24S	TX-PFA-PFA-24S	EX-PFA-PFA-24S

Note: The above order codes represent the more popular constructions. However, other designs are available upon request.

Inner Shield

All above thermocouple and extension wire can be finished with a inner shield (Stainless steel-SSB), If you need the wire with a inner shield, please add "**SSB**" to the order code, such as "**JX-PFA-SSB-PFA-20S**", it means Type JX, 20AWG, Stranded, Conductor insulation: PFA, Inner shield: Stainless steel, Jacket insulation: PFA.

Outer Shield

All above thermocouple and extension wire also can be finished with a metal outer shield to give added protection from abrasion and mechanical damage. If you need the wire with a outer shield, please add "**SSB**" to the order code, such as "**JX-PFA-PFA-SSB-20S**", it means Type JX, 20AWG, Stranded, Conductor insulation: PFA, Jacket insulation: PFA, Outer shield: Stainless steel.



PFA Insulated Thermocouple & Extension Wire (PFA-PFA)

Color Code & Initial Calibration Tolerance for Thermocouple Wire

Thermocouple Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	J	White/Red	Brown	0℃ to +285℃ 285℃ to +750℃	±2.2℃ ± .75%	±1.1℃ ± .4%
Chromel(+) vs. Alumel(-)	K	Yellow/Red	Brown	-200℃ to -110℃ -110℃ to 0℃ 0℃ to +285℃ 285℃ to +1250℃	± 2% ±2.2℃ ±2.2℃ ± .75%	 ±1.1℃ ± .4%
Copper(+) vs. Constantan(-)	T	Blue/Red	Brown	-200℃ to -65℃ -65℃ to +130℃ 130℃ to +350℃	± 1.5% ±1℃ ± .75%	± .8% ± .5℃ ± .4%
Chromel(+) vs. Constantan(-)	E	Purple/Red	Brown	-200℃ to -170℃ -170℃ to +250℃ 250℃ to +340℃ 340℃ to +900℃	± 1% ±1.7℃ ±1.7℃ ± .5%	±1℃ ±1℃ ± .4% ± .4%

Color Code & Initial Calibration Tolerance for Extension Wire

Extension Type		ANSI Color Code		Initial Calibration Tolerances		
Wire Alloys	Calibration	Conductor (+/-)	Jacket	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	JX	White/Red	Black	0℃ to +200℃	±2.2℃	±1.1℃
Chromel(+) vs. Alumel(-)	KX	Yellow/Red	Yellow	0℃ to +200℃	±2.2℃	±1.1℃
Copper(+) vs. Constantan(-)	TX	Blue/Red	Blue	-60℃ to +100℃	±1.1℃	± .5℃
Chromel(+) vs. Constantan(-)	EX	Purple/Red	Purple	0℃ to +200℃	±1.7℃	±1.1℃

Nominal Insulation Thickness

Wire Size (AWG)	Conductor Insulation Thickness (mm)	Jacket Insulation Thickness (mm)	Outer Diameter (mm)
14	0.20	0.25	2.6×4.8
16	0.20	0.25	2.2×3.9
16 7/24	0.20	0.25	2.4×4.3
20	0.20	0.25	1.7×2.9
20 7/28	0.20	0.25	1.8×3.1
24	0.20	0.25	1.4×2.3
24 7/32	0.20	0.25	1.6×2.7

PFA-PFA Physical Properties

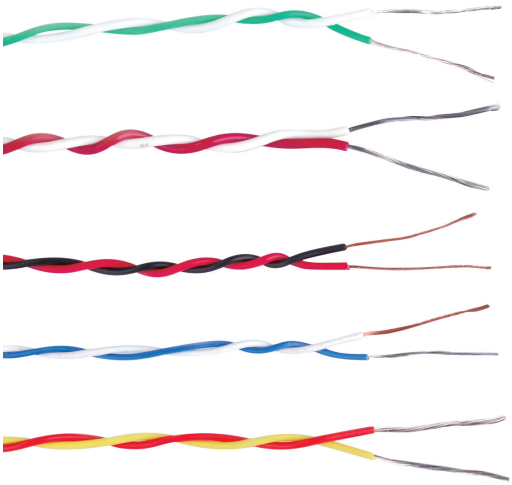
Characteristics	Insulation	Jacket
Abrasion Resistance	Very good	Very good
Cut Through Resistance	Good	Good
Moisture Resistance	Excellent	Excellent
Solder Iron Resistance	Good	Good
Service Temperature	260℃ continuous 288℃ single	260℃ continuous 288℃ single
Flame Test	Non-flammable	Non-flammable

ZONZEN

FEP Insulated Twisted Thermocouple & Extension Wire(FEP-TW)

Specification

- Conductor calibration: K, J, E, T
- Conductor insulation: FEP
- Construction: Twisted conductor
- Max. temp. : 200℃
- Color code: ANSI, IEC & JIS



Model Explanation

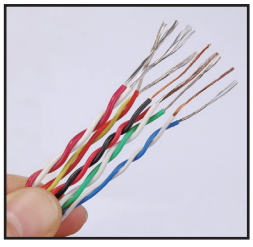
K - FEP - TW - 20 S
① ② ③ ④ ⑤

① Calibration: K, J, T, E
② Conductor insulation material: FEP
③ Means "Twisted"
④ Wire size (AWG)
⑤"S" means "Stranded"; "Blank" means "Solid"

Order Code

Wire Grade	Wire Size (AWG)	Wire Type	Calibration			
			Type J	Type K	Type T	Type E
Thermocouple	20	Solid	J-FEP-TW-20	K-FEP-TW-20	T-FEP-TW-20	E-FEP-TW-20
	20 7/28	Stranded	J-FEP-TW-20S	K-FEP-TW-20S	T-FEP-TW-20S	E-FEP-TW-20S
	24	Solid	J-FEP-TW-24	K-FEP-TW-24	T-FEP-TW-24	E-FEP-TW-24
	24 7/32	Stranded	J-FEP-TW-24S	K-FEP-TW-24S	T-FEP-TW-24S	E-FEP-TW-24S
	30	Solid	J-FEP-TW-30	K-FEP-TW-30	T-FEP-TW-30	E-FEP-TW-30
Extension	20	Solid	JX-FEP-TW-20	KX-FEP-TW-20	TX-FEP-TW-20	EX-FEP-TW-20
	20 7/28	Stranded	JX-FEP-TW-20S	KX-FEP-TW-20S	TX-FEP-TW-20S	EX-FEP-TW-20S
	24	Solid	JX-FEP-TW-24	KX-FEP-TW-24	TX-FEP-TW-24	EX-FEP-TW-24
	24 7/32	Stranded	JX-FEP-TW-24S	KX-FEP-TW-24S	TX-FEP-TW-24S	EX-FEP-TW-24S
	30	Solid	JX-FEP-TW-30	KX-FEP-TW-30	TX-FEP-TW-30	EX-FEP-TW-30

Note: The above order codes represent the more popular constructions. However, other designs are available upon request.



FEP Insulated Twisted Thermocouple & Extension Wire(FEP-TW)

Color Code & Initial Calibration Tolerance for Thermocouple Wire

Thermocouple Type		Initial Calibration Tolerances			
Wire Alloys	Calibration	Conductor (+/-)	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	J	White/Red	0℃ to +285℃ 285℃ to +750℃	±2.2℃ ± .75%	±1.1℃ ± .4%
Chromel(+) vs. Alumel(-)	K	Yellow/Red	-200℃ to -110℃ -110℃ to 0℃ 0℃ to +285℃ 285℃ to +1250℃	± 2% ±2.2℃ ±2.2℃ ± .75%	 ±1.1℃ ± .4%
Copper(+) vs. Constantan(-)	T	Blue/Red	-200℃ to -65℃ -65℃ to +130℃ 130℃ to +350℃	± 1.5% ±1℃ ± .75%	± .8% ± .5℃ ± .4%
Chromel(+) vs. Constantan(-)	E	Purple/Red	-200℃ to -170℃ -170℃ to +250℃ 250℃ to +340℃ 340℃ to +900℃	± 1% ±1.7℃ ±1.7℃ ± .5%	±1℃ ±1℃ ± .4% ± .4%

Color Code & Initial Calibration Tolerance for Extension Wire

Extension Type		Initial Calibration Tolerances			
Wire Alloys	Calibration	Conductor (+/-)	Temperature Range	Standard Limits	Special Limits
Iron(+) vs. Constantan(-)	JX	White/Red	0℃ to +200℃	±2.2℃	±1.1℃
Chromel(+) vs. Alumel(-)	KX	Yellow/Red	0℃ to +200℃	±2.2℃	±1.1℃
Copper(+) vs. Constantan(-)	TX	Blue/Red	-60℃ to +200℃	±1.1℃	± .5℃
Chromel(+) vs. Constantan(-)	EX	Purple/Red	0℃ to +200℃	±1.7℃	±1.1℃

Nominal Insulation Thickness

Wire Size (AWG)	Conductor Insulation Thickness (mm)	Outer Diameter (mm)
16	0.20	3.4
16 7/24	0.20	3.8
20	0.20	2.4
20 7/28	0.20	2.6
24	0.20	1.8
24 7/32	0.20	2.0

FEP-TW Physical Properties

Characteristics	Insulation
Abrasion Resistance	Very good
Cut Through Resistance	Good
Moisture Resistance	Excellent
Solder Iron Resistance	Good
Service Temperature	200℃ continuous 250℃ single
Flame Test	Self-extinguishing