

◆ Infrared Furnaces - Desktop & Vertical

- 1- Uniform thermal distribution within the hot zone (Skin Effect)
- 2- High heating (600 °C/min) & cooling (250 °C/min) rates
- 3- Rapid heat treatment & thermal shock cycling
- 4- Surface heat treatment



Model	Heating Length (cm)	Type	Voltage (V)	Power (KW)	Max Heating rate (°C/min)	Design Temperature (°C)	Working Temperature (°C)
FIR12-30-V	30 cm	Vertical	380	12 KW	5 °C/s	1000	900
FIR18-30-V	30 cm	Vertical	380	18 KW	10 °C/s	1100	1000
FIR12-50-V	50 cm	Vertical	380	12 KW	5 °C/s	1000	900
FIR18-50-V	30 cm	Vertical	380	18 KW	10 °C/s	1100	1000
FIR12-30-H	30 cm	Desktop	380	12 KW	5 °C/s	1000	900
FIR18-30-H	30 cm	Desktop	380	18 KW	10 °C/s	1100	1000
FIR12-50-H	50 cm	Desktop	380	12 KW	5 °C/s	1000	900
FIR18-50-H	50 cm	Desktop	380	18 KW	10 °C/s	1100	1000

The furnace must be equipped to a cooling tower or air-cooled water system

◆ Infrared Dryers (Oven)

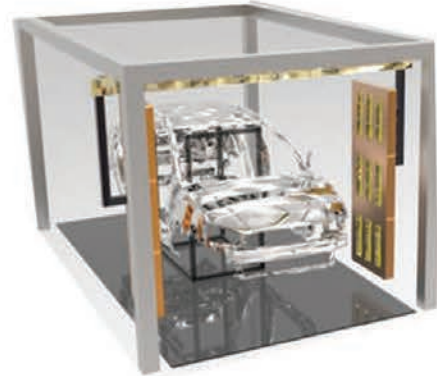
- 1- High efficiency, quality, durability & production rate
- 2- Products design appealing to target requirements
- 3- Local concentrated heating
- 4- After-sale services



Model	Tray Area (L * W in cm)	Section	Voltage (V)	Power (KW)	Dry fruit capacity (Kg)	Working Temperature (°C)
DIR-50-1	50×40	1	220	2 KW	2	100
DIR-50-2	50×40	2	220	4 KW	4	100
DIR-50-4	50×40	4	200	8 KW	8	100
DIR-100-CO	100×100	-	380	10 KW	10	100

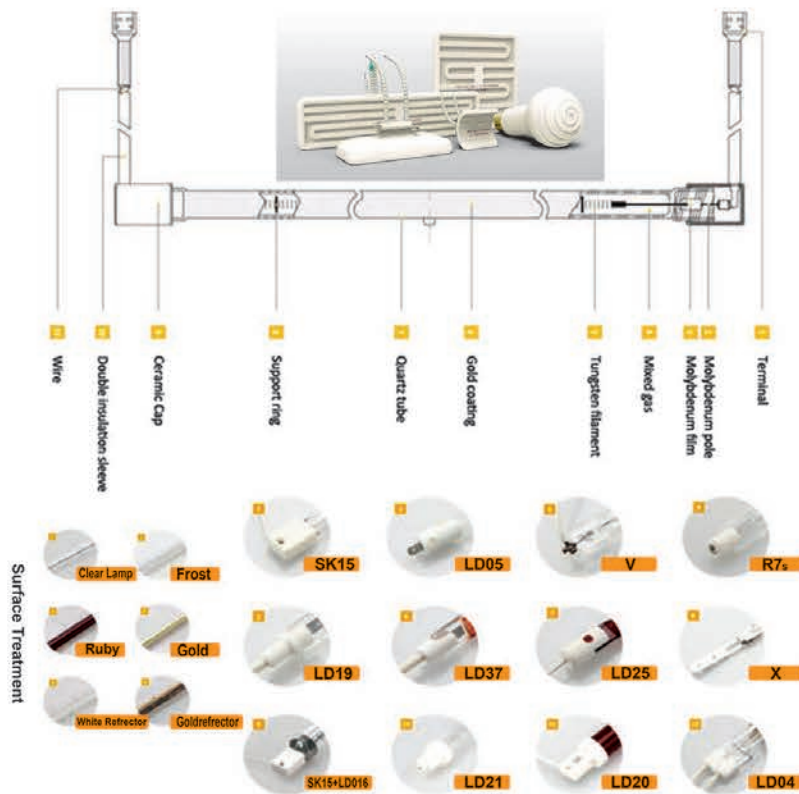
◆ Infrared Plant Dryers

- 1- High heat transfer capacity
- 2- Heating requires no contact
- 3- Products design appealing to the target customer dimensions
- 4- Short response times with fast heating enabling good controlability and quality



Model	Radiation Area (Cm ²)	Panel Dimensions (Cm)	Panels Quantity	Lamps Quantity	Voltage (V)	Power (KW)	Working Temperature (°C)
PIR30-1	30 × 15	40 × 20	1	1	220	2 KW	150
PIR50-1	50 × 15	60 × 20	1	1	220	2 KW	150
PIR80-1	80 × 15	90 × 20	1	1	220	2 KW	150
PIR80-3	80 × 50	90 × 55	3	3	220	6 KW	250
PIR-Robot-1	50 × 70	60 × 80	1	4	220	8 KW	250

◆ Tungsten, Carbon Fibers & Ceramic Infrared Emitters



Wavelength	Abbreviation	Wave Length (μm)	Power (KW)	Heating Element
Near infrared	NIR, IR-A	0.75-1.4	0.5-5	Tungsten Halogen Lamp
Short-wave infrared	SWIR, IR-B	1.4-3	0.5-3	Tungsten Halogen Lamp
Mid-wave infrared	MWIR, IR-C	3-8	0.5-2	Carbon Fiber Halogen Lamp
Long-wave infrared	LWIR, IR-C	8-15	0.2-2	Ceramic Infrared Emitter
Far infrared	FIR	15-1000	0.2-2	Ceramic Infrared Emitter

◆ Laboratory Air Flow & Hot Air Ovens

- 1- Provide uniform temperatures distribution and precise control
- 2- Drying, heating and curing polymer materials
- 3- After-sales services



Model	Hot Zone Dimension (L*D*H in cm)	Furnace capacity (L)	Voltage (V)	Power (KW)	Element Material	Working Temperature (°C)
Oven	30×30×30	27	220	2	Kanthal (FeCrAl alloy) A1	300
	40×40×40	64	220	3	Kanthal (FeCrAl alloy) A1	300
	50×50×50	125	220	4	Kanthal (FeCrAl alloy) A1	300
	100×100×200	2000	380	10	Kanthal (FeCrAl alloy) A1	300

◆ Box Type Electric Furnaces

- 1- Uniform furnace thermal gradient with precise temperature control
- 2- products design appealing to the target dimensions and options
- 3- User-friendly design with easy-to-handle operation
- 4- After-sales services



◆ Box Type Electric Furnaces

Model	Hot Zone Dimension (L*D*H in cm)	Furnace capacity (L)	Type	Voltage (V)	Power (KW)	Element Material	Design Temperature (°C)	Working Temperature (°C)
BEF1200C-2L	10×10×20	2	Front Door	220	2	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-10L	20×20×25	10	Front Door	220	3	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-32L	30×30×35	32	Front Door	220	4	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-64L	40×40×40	64	Front Door	220	5	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-125L	50×50×50	125	Front Door	220	7	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-200L	60×60×55	200	Front Door	220	9	Kanthal (FeCrAl alloy) A1	1200	1150
BFTD 1200C-200L	60×60×55	200	Top Door	380	12	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-300L	60×60×85	300	Front Door	380	12	Kanthal (FeCrAl alloy) A1	1200	1150
BFTD 1200C-400L	60×65×100	400	Top Door	380	15	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-500L	70×70×100	500	Front Door	380	20	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1200C-1000L	100×100×100	1000	Front Door	380	33	Kanthal (FeCrAl alloy) A1	1200	1150
BEF1450C-2L	10×10×20	2	Front Door	220	2	SiC – GD/SC/SCR Type	1500	1450
BEF1450C-10L	20×20×25	10	Front Door	220	3	SiC – GD/SC/SCR Type	1500	1450
BEF1450C-32L	30×30×35	32	Front Door	220	5	SiC – GD/SC/SCR Type	1500	1450
BEF1450C-64L	40×40×40	64	Front Door	220	7	SiC – GD/SC/SCR Type	1500	1450
BEF1450C-500L	70×70×100	500	Front Door	380	20	SiC – GD/SC/SCR Type	1500	1450
BEF1450C-1000L	100×100×100	1000	Front Door	380	33	SiC – GD/SC/SCR Type	1500	1450
BEF1700C-2L	10×10×20	2	Front Door	220	1.5	MoSi ₂ – Straight/U type	1800	1750
BEF1700C-10L	20×20×25	10	Front Door	220	3	MoSi ₂ – Straight/U type	1800	1750
BEF1700C-32L	30×30×35	32	Front Door	220	4	MoSi ₂ – Straight/U type	1800	1750
BEF1700C-64L	40×40×40	64	Front Door	220	5	MoSi ₂ – Straight/U type	1800	1750



◆ Electric Tube Furnaces

- 1- Design appealing to the target dimensions
- 2- Ability to rotate 360 degrees and height adjustment
- 3- Precise high temperature control ($\pm 1\text{ }^{\circ}\text{C}$) and fast sample loading
- 4- Developing process by a reactor for vacuum or atmosphere heat treatment Products



Model	Tube Diameter (cm)	Type	Voltage (V)	Power (KW)	Element Material	Reactor Material	Design Temperature ($^{\circ}\text{C}$)	Working Temperature ($^{\circ}\text{C}$)
TF12-7-30	7	Desktop	220	3	Kanthal (FeCrAl alloy) A1	S.S 310 / Quartz	1200	1150
TFS12-7-30	7	Split	220	3	Kanthal (FeCrAl alloy) A1	S.S 310 / Quartz	1200	1150
TF12-9-30	9	Desktop	220	3.5	Kanthal (FeCrAl alloy) A1	S.S 310 / Quartz	1200	1150
VTFS12-9-30	9	Split	220	3	Kanthal (FeCrAl alloy) A1	S.S 310 / Quartz	1200	1150
VTF12-9-30	9	Vertical	220	3	Kanthal (FeCrAl alloy) A1	S.S 310 / Quartz	1200	1150
2TF12-7-30	7	Desktop ++ (Double Hot Zone)	220	6	Kanthal (FeCrAl alloy) A1	S.S 310 / Quartz	1200	1150
TF14-7-35	7	Desktop	220	6	SiC - GD/SC/GC Type	SiC/Alumina	1500	1450
TF14-9-35	9	Desktop	220	6	SiC - GD/SC/GC Type	SiC/Alumina	1500	1450
TF17-5-30	5	Horizontal	220	4	MoSi ₂ - Straight type	Alumina high Density 99.8	1800	1750
TF17-7-30	7	Horizontal	220	5	MoSi ₂ - Straight type	Alumina high Density 99.8	1800	1750

◆ Electric Box Atmosphere Controlled Furnaces

- 1- Heat treatment of metallic, ceramic and composite materials under, neutral, mixed (Ar-H₂, N₂-H₂) and Hydrogen atmospheres up to 1700 °C temperature
- 2- Uniform furnace temperature gradient with precise temperature control (± 2 °C)
- 3- Equipped with an air-cooled water cooling system



Model	Hot Zone Dimension (L*D*H in cm)	Furnace capacity (L)	Voltage (V)	Power (KW)	Element Material	Design Temperature (°C)	Working Temperature (°C)
BAF -1150-30L	30×30×30	30	220	4	Kanthal (FeCrAl alloy) A1	1200	1150
BAF -1150-64L	40×40×40	64	220	5		1200	1150
BAF -1450-30L	30×30×30	30	380	6	SiC – SCR Type (or Mo wire)	1500	1450
BAF -1450-64L	40×40×40	64	380	8		1500	1450
BAF -1750-30L	30×30×30	30	380	3	MoSi ₂ – U type	1800	1750
BAF -1450-64L	40×40×40	64	380	5		1800	1750

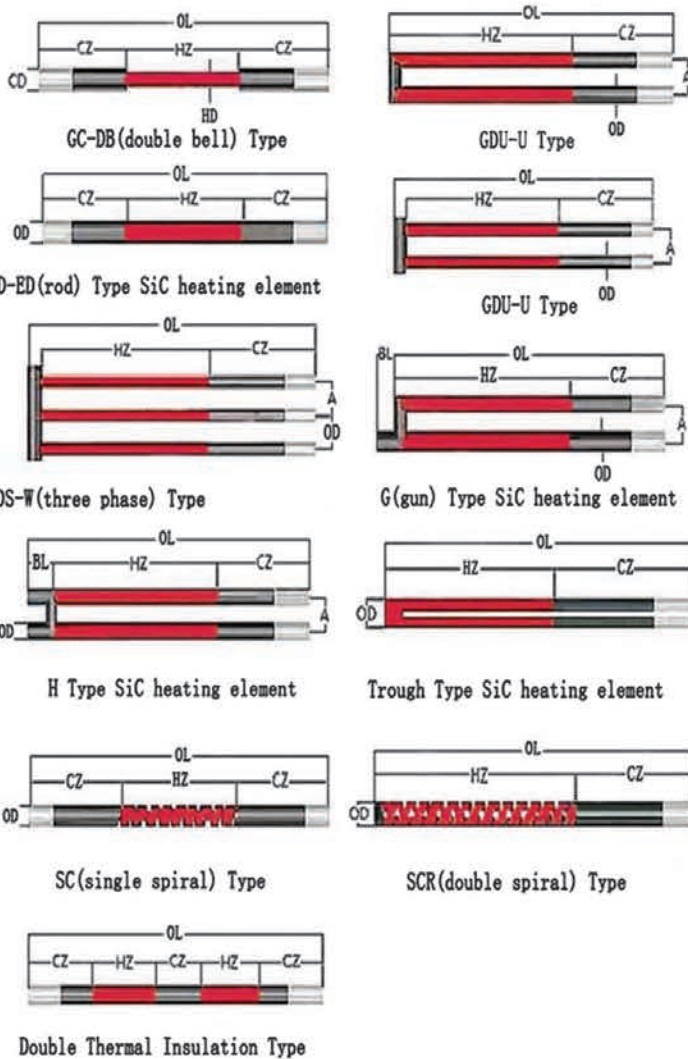
◆ Bottom Loading/Opening Furnaces

- 1- Fast heat treatment of materials (quenching, melting & thermal shock)
- 2- Uniform furnace temperature gradient with precise temperature control ($\pm 1^\circ\text{C}$)
- 3- Design products appealing to the target dimensions
- 4- User-friendly design with easy sample loading



Model	Hot Zone Dimension (L*D*H in cm)	Voltage (V)	Power (KW)	Element Material	Design Temperature ($^\circ\text{C}$)	Working Temperature ($^\circ\text{C}$)
BEL1200-8L	20×20×20	220	3	Kanthal (FeCrAl alloy) A1	1200	1150
BEL1200-27L	30×30×30	220	6			
BEL1400-8L	20×20×20	220	8	SiC-GD/SC/GC Type	1450	1400
BEL1400-27L	30×30×30	380	6			
BEL1700-8L	20×20×20	220	8	MoSi ₂ -U type	1750	1700
BEL1700-27L	30×30×30	380	5			

◆ Silicon Carbide (SiC) Heating Elements



Atmosphere	Maximum Working Temperature of the Element (°C)	Comments
Clean Air	1650	No detrimental effect
Pure oxygen	1500	Faster oxidization than in air.
Nitrogen	1350	Form insulating Silicon Nitrides
Dry hydrogen	1200	Reduces silica film, Form CH ₄ from SiC
Dry exothermic gas	1400	Dependent on composition
Dry endothermic gas	1255	Dependent on composition
Vacuum	1200	Below vaporizes SiC. Short term use only

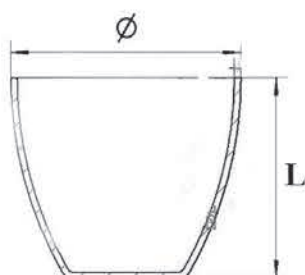
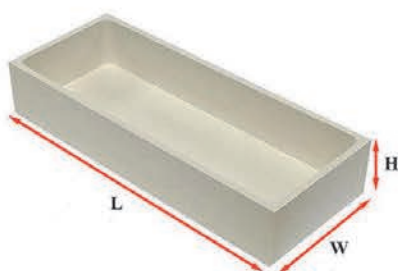
◆ Molybdenum Disilicide (MoSi₂) Heating Elements

Types of mosi2 heater	Pictures
U type 	
W type 	
Straight type 	
L type(bend 135°) 	
L type (bend 90°) L type (90° Bend at Lu) 	 
Special shape 	
<ol style="list-style-type: none"> Specifications (mm): 3/6, 4/9, 6/12, 7/14, 9/18, 12/24. Other types can customize. D1 (Diameter of hot zone) :mm D2(Diameter of cold zone):mm Le(Length of hot zone):mm Lu(Length of cold zone):mm A(Shank spacing):mm 	

Atmosphere	The Maximum Working Temperature of the Element	
NO ₂ , CO ₂ , O ₂ , Air	1700 °C	1800 °C
He, Ar, Ne	1650 °C	1750 °C
SO ₂	1600 °C	1700 °C
CO, H ₂	1500 °C	1600 °C
Wet H ₂	1400 °C	1500 °C
Dry H ₂	1350 °C	1450 °C

◆ Manufacturing Muffle Block, Fire Clay, SiC, Alumina and Graphite Boats & Crucibles

Material	Geometry	Dimension (mm)	Volume (CC)	Max Allowable Temp (°C)
Fire Clay (Fire Assay)	Crucible	40*40	25	1400
		50*50	50	1400
		65*60	100	1400
		80*90	150	1400
		105*170	500	1400
	Boat	25*40*50	20	1400
		30*40*100	75	1400
		30*40*140	125	1400
		30*50*220	200	1400
		50*90*90	300	1400
Alumina	Crucibl	35*30	10	1700
		40*40	30	1700
		80*90	150	1700
	Boat	20*40*50	25	1700
		20*40*90	50	1700
		20*30*130	75	1700
SiC	Crucible	35*30	10	1500
		40*40	30	1500
		80*90	150	1500
	Boat	20*40*50	25	1500
		20*40*90	50	1500
		20*30*130	75	1500
Graphite	Crucible	35*30	10	2200
		40*40	30	2200
		80*90	150	2200
	Boat	20*40*50	25	2200
		20*40*90	50	2200
		20*30*130	75	2200
		40*20*170	100	2200

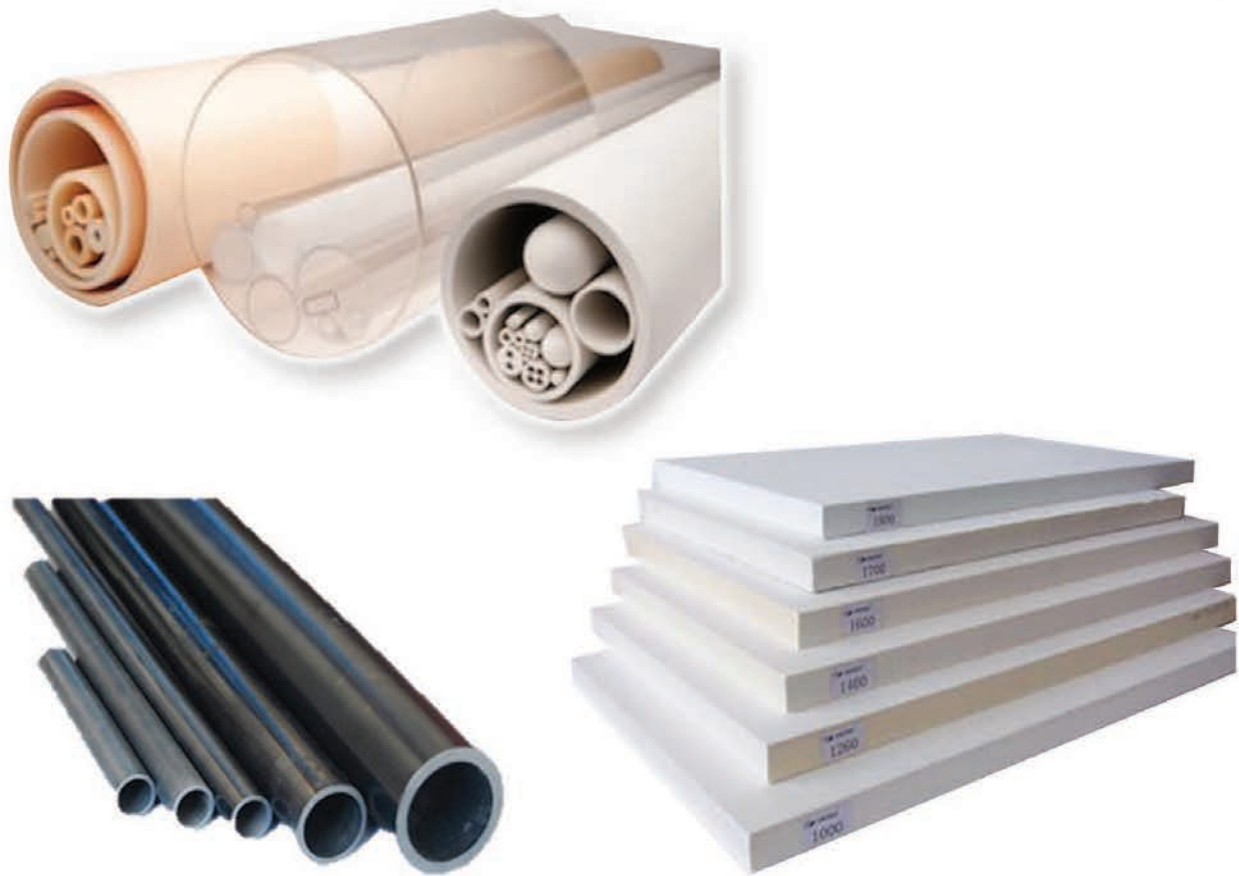


◆ Producing Different Thermocouples



ANSI Code	ANSI MC 96.1 Color Coding		Alloy Combination		Comments Environment Bare Wire	Maximum T/C Grade Temp Range	EMF (mV) Over Max Temp Range	IEC 584-3 Color Coding		IEC Code
	Thermocouple Grade	Extension Grade	+ Lead	- Lead				Thermocouple Grade	Intrinsically Safe	
J			IRON Fe (magnetic)	CONSTANTAN COPPER-NICKEL Cu-Ni	Reducing, Vacuum, Inert. Limited Use in Oxidizing at High Temperatures. Not Recommended for Low Temperatures.	-210 to 1200°C -346 to 2193°F	-8.095 to 69.553			J
K			CHROME [®] GA NICKEL-CHROMIUM Ni-Cr	ALOMEGA [®] NICKEL-ALUMINUM Ni-Al (magnetic)	Clean Oxidizing and Inert. Limited Use in Vacuum or Reducing. Wide Temperature Range, Most Popular Calibration	-270 to 1372°C -454 to 2501°F	-6.458 to 54.886			K
T			COPPER Cu	CONSTANTAN COPPER-NICKEL Cu-Ni	Mild Oxidizing, Reducing Vacuum or Inert. Good Where Moisture Is Present. Low Temperature & Cryogenic Applications	-270 to 400°C -454 to 752°F	-6.258 to 20.872			T
E			CHROME [®] GA NICKEL-CHROMIUM Ni-Cr	CONSTANTAN COPPER-NICKEL Cu-Ni	Oxidizing or Inert. Limited Use in Vacuum or Reducing. Highest EMF Change Per Degree	-270 to 1000°C -454 to 1832°F	-9.835 to 76.373			E
N			OMEGA-P [®] NICROSIL Ni-Cr-Si	OMEGA-N [®] NISIL Ni-Si-Mg	Alternative to Type K. More Stable at High Temps	-270 to 1300°C -450 to 2372°F	-4.345 to 47.513			N
R	NONE ESTABLISHED		PLATINUM-13% RHODIUM Pt-13% Rh	PLATINUM Pt	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature	-50 to 1768°C -58 to 3214°F	-0.226 to 21.101			R
S	NONE ESTABLISHED		PLATINUM-10% RHODIUM Pt-10% Rh	PLATINUM Pt	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature	-50 to 1768°C -58 to 3214°F	-0.236 to 18.693			S
U	NONE ESTABLISHED		COPPER Cu	COPPER-LOW NICKEL Cu-Ni	Extension Grade Connecting Wire for R & S Thermocouples. Also Known as RX & SX Extension Wire.					U
B	NONE ESTABLISHED		PLATINUM-30% RHODIUM Pt-30% Rh	PLATINUM-6% RHODIUM Pt-6% Rh	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temp. Common Use in Glass Industry	0 to 1820°C 32 to 3308°F	0 to 13.820			B

◆ Supplying Ceramic Fiber Boards, Quartz/SiC & Alumina Pipes (Reactor)



Description	1260 Ceramic Fiber Board	1425 Ceramic Fiber Board	1600 Ceramic Fiber Board	1800 Ceramic Fiber Board	1900 Ceramic Fiber Board
Classification Temperature(°C)	1260	1425	1600	1800	1900
Density (Kg/m3)	250-350	250-350	300-350	300-500	300-500
Linear shrinkage(%) (°C*24 h)	1.1 (1100)	1.6 (1200)	1.2 (1400)	1.0 (1600)	<1.0 (1500)
Rupture Strength (Kg/Cm2)	5	5	6	6	6
Thermal conductivity rate Kcal/mh°C (w/mk) ,ASTM C201					
-	250 Kg/m3	250 Kg/m3	300 Kg/m3	300 Kg/m3	500 Kg/m3
Average 400°C	0.09	-	-	-	-
Average 600°C	0.14	0.1	0.12	-	-
Average 800°C	0.18	0.14	0.16	-	0.12
Average 1000°C	-	0.2	0.21	0.211	0.19
Average 1200°C	-	-	-	0.232	0.22
Average 1800°C	-	-	-	0.7	0.7
Chemical composition (%)					
Al ₂ O ₃	42	45	72	75	87
SiO ₂ +Al ₂ O ₃	75	80	98	99	>99.5
Fe ₂ O ₃	0.2	0.2	<0.1	<0.1	<0.1
Dimension (mm/pcs)	1200*1000*25/50;				
	900*600*6/12.5/20/25/50				