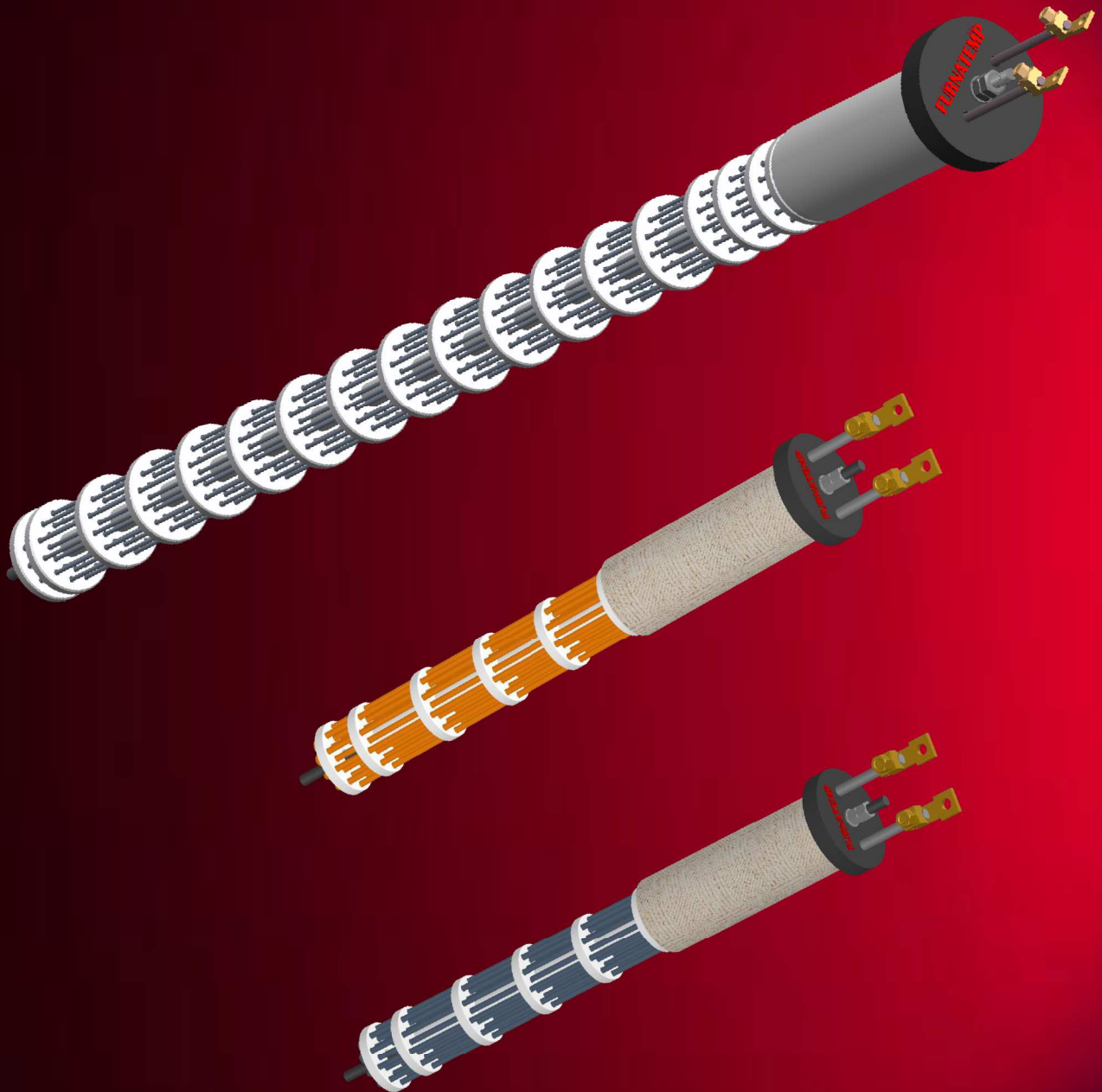


FURNATEMP® BUNDLE ROD HEATERS



FURNATEMP® Bundle rod heater consists of circular/star/cone shaped ceramic discs that hold the heating elements. It is designed for long life and maintenance free operation. The hot zone and cold zone lengths can be adjusted as per the specific requirement, Bundle rod can be used with or without radiant tube. Due to innovative design, Bundle rod heaters deliver a much higher power than conventional heaters. In combination with radiant tubes, a system is created which delivers high power, is rugged, versatile and needs low maintenance. Furnatemp Bundle Rod Heaters can be mounted horizontally or vertically. Heating alloy used in these Heaters are either NiCr alloy or FeCrAl alloy.

POWER DELIVERY

Bundle rod elements can be designed with a higher power compared with conventional heaters. Its strong heating ability and high efficiency guarantee outstanding results in various applications.

ADVANTAGES

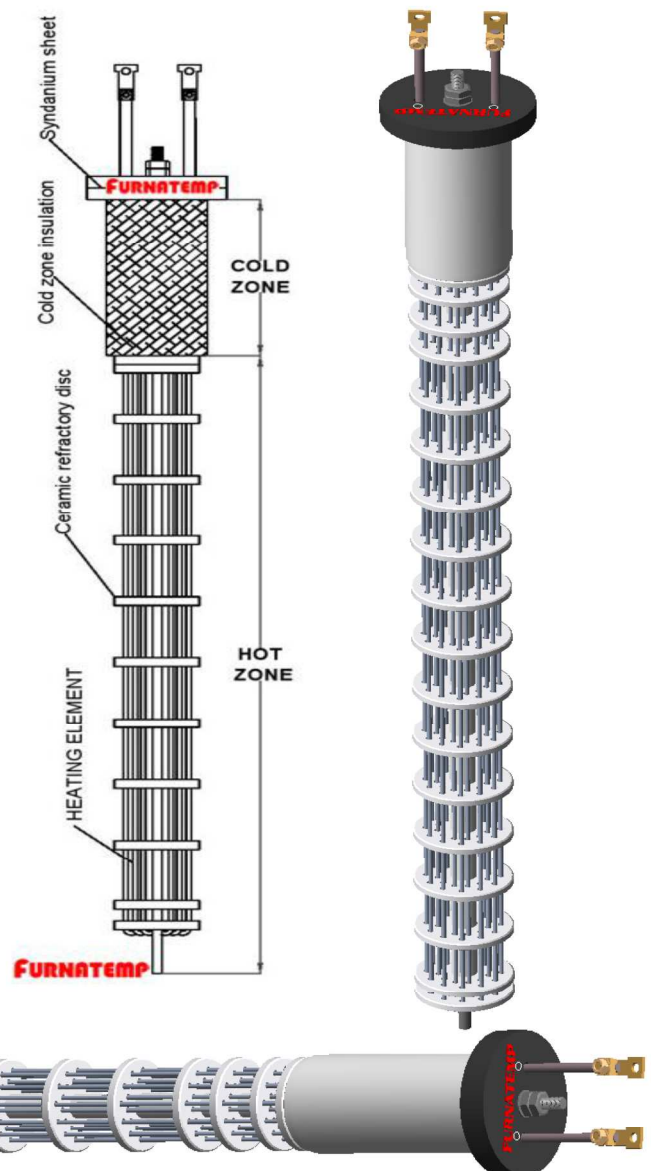
- Maintenance Friendly
- Fast to install & Replace
- Custom Built & Standard Design
- Higher productivity & Timely Delivery

APPLICATIONS

- Heat treatment Furnaces & Automobile Industries
- Sealed quenched furnaces
- Aluminum annealing & Melting
- Salt bath Furnaces & Hot air ovens
- Heating cassettes
- All type of Electrical Heat Treatment Furnaces & ovens

TECHNICAL SPECIFICATIONS

Wattage/Power	0.5KW to 100KW
Heating Element	FeCrAl alloy or NiCr alloy
Ceramic Refractory Disc	circular/star/cone shaped ceramic discs. Standard size 40mm to 180mm & Custom Built.
Cold zone Insulation	Furnatemp Insulation Board & Ceramic Fiber blanket
Terminal connector	Brass connector & Flexible Aluminum Birded



FURNATEMP METALIC HEATING ELEMENT DATA

	Fe-Cr-Al Heating Element				Ni-Cr Heating Element	
	FURNA -T1		FURNA-TPM		FURNA-NiCr80	
Standard chemical Components (%)	Al	6.0	Al	6.0	Cr	19-21
	Cr	23	Cr	23	Fe	1 or less
	Fe	Remaining	Fe	Remaining	Ni	77 or more
	Other elements in small quantity					
Max. duty temp. of Heating Elements (°C)	1400		1420		1100	
Electric resistivity 20 °C (μΩ-m)	1.45 ± 5%		1.45 ± 5%		1.08 ± 5%	
Expansion from thermal Factor (for various temperature range)	15.1×10 ⁻⁶ [20°C - 1000°C (°C ⁻¹)]		14.8×10 ⁻⁶ [20°C - 1000°C (°C ⁻¹)]		17.6×10 ⁻⁶ [20°C - 1000°C (°C ⁻¹)]	
			15.9×10 ⁻⁶ [20°C - 1400°C (°C ⁻¹)]			
Yield strength MPa	300-600		300-600		200-600	
Hardness (HV)	200-240		200-240		150-190	
Melting Point (°C)	1500		1500		1400	
Electric resistance temperature coefficient	33×10 ⁻⁶		15×10 ⁻⁶		58×10 ⁻⁶	
Increase from Oxidation 1,200°C (mg/cm² h)	0.05		0.05		0.25 or less	
Tensile strength	MPa		650-900	650-900	700-900	
	(kgf/mm²)		(65-90)	(65-90)	(70-90)	
Specific Gravity	7.1		7.1		8.4	
Elongation (%)	15-25		15-25		20 or more	
Emissivity - fully oxidized material	0.70		0.70		0.88	
Max operating temperature in air (°C)	1250		1250		1100	
Magnetic Properties	Magnetic		Magnetic		Non- Magnetic	
Recommended Surface loading (W/cm²) (for various temperature range)	Max. 5 W/cm² [100- 500 °C]		Max. 6 W/cm² [100- 500 °C]		Max. 5 W/cm² [100- 500 °C]	
	Max. 3 W/cm² [500- 800 °C]		Max. 3.5 W/cm² [500- 800 °C]		Max. 3 W/cm² [500- 800 °C]	
	Max. 2.5 W/cm² [800- 1050 °C]		Max. 3 W/cm² [800- 1050 °C]		Max. 2 W/cm² [800- 1100 °C]	
	Max. 1.5 W/cm² [1050- 1250 °C]		Max. 2 W/cm² [1050- 1250 °C]			

NOTE: Surface loading for Heating Element in Radiant tube is lower than above

Temperature factor of resistivity of **FURNA-T1 & FURNA -TPM**

Multiply the resistance at the normal temperature by the coefficient [Ct] shown below to obtain the resistance at working temperatures.

Temp. °C	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
Ct	1.00	1.00	1.00	1.01	1.01	1.02	1.02	1.03	1.03	1.04	1.04	1.04	1.04	1.04

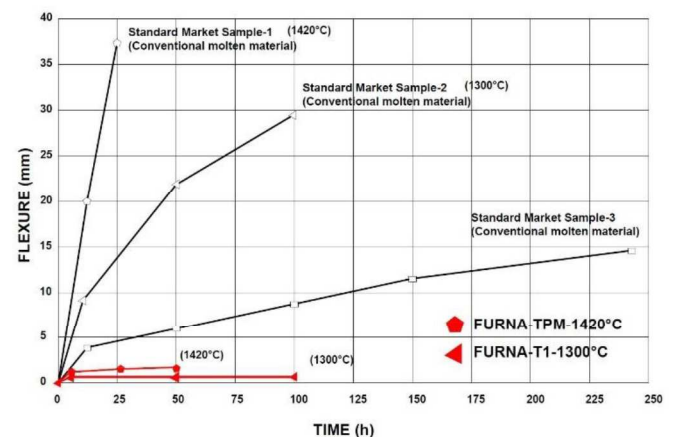
Specific heat capacity of **FURNA-T1 & FURNA -TPM**

Temp °C	20	200	400	600	800	1000	1200	1400
kJ kg ⁻¹ K ⁻¹	0.46	0.56	0.63	0.75	0.71	0.72	0.74	0.80

Thermal conductivity of **FURNA-T1 & FURNA -TPM**

Temp °C	50	600	800	1000	1200	1400
W m ⁻¹ K ⁻¹	11	20	22	26	27	35

High temperature Deformation resistance graph for different Temperature & Grade



FURNATEMP

ISO 9001-2015 COMPANY

The Heat with Solutions

www.furnatemp.com

FURNATEMP BUNDLE ROD GALLERY



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