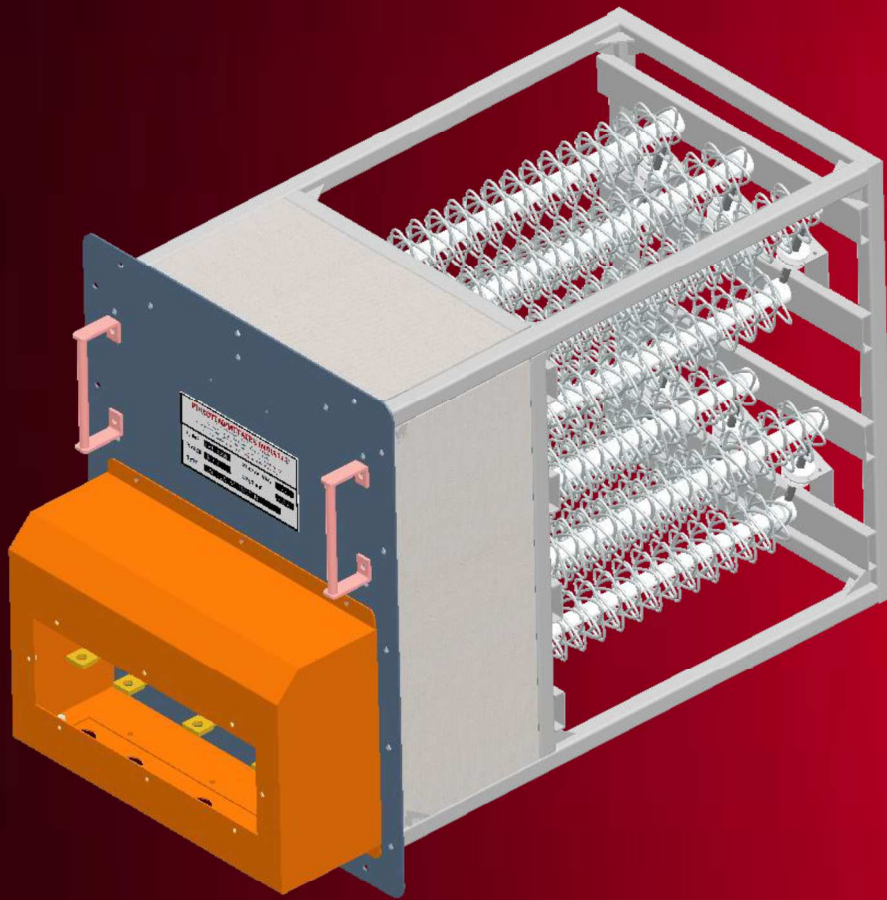


FURNATEMP® HEATING CASSETTES



FURNATEMP PORCUPINE/STAR CASSETTE CONSTRUCTION AND MOUNTING OF HEATING ELEMENT WITH REFRACTORY DETAILS

The structure frame is fabricated out of SS 310 angles. The heaters are placed on high alumina ceramic tubes. The tubes are fixed to the frame by SS 310 center rods with both end threaded and insulated properly. The structural frame is liberally reinforced with SS 310 channels to withstand air velocity and the temperature. The heating cassette is provided with ceramic fiber insulation in the furnace wall area. The suitable ceramic fiber rope gaskets are provided to on the front plate. The electrical terminations are brought out in the front plate and the electrical terminals are protected with terminal cover.

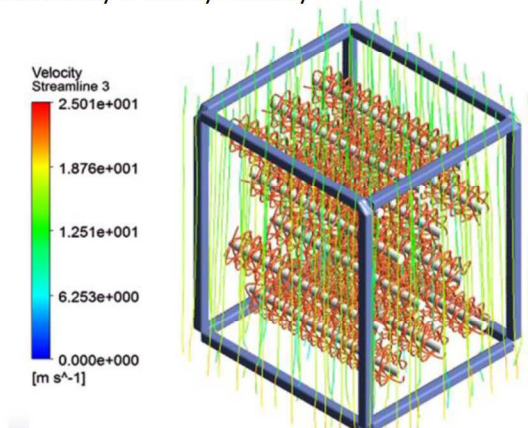
These cassettes can be mounted horizontally or vertically. Heating alloy used in these Heaters are either NiCr alloy or FeCrAl alloy.

POWER DELIVERY

More power density can be achieved in a given space, due to this large freely exposed surface area. It 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



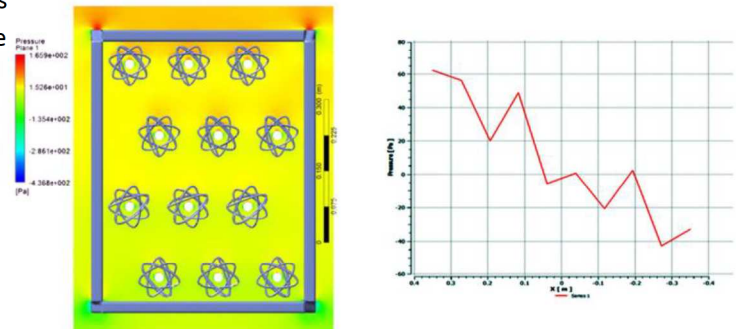
TECHNICAL SPECIFICATIONS

Wattage/Power	Custom Design
Heating Element	FeCrAl alloy or NiCr alloy
Ceramic Refractory	High Alumina tube, washers & Bobbins
Cold zone Insulation	Furnatemp Insulation Board & Ceramic Fiber blanket
Terminal connector	Specially Designed Brass connector

APPLICATIONS

- Hot air ovens
- Tempering applications
- Annealing
- Stress Relieving
- Heating of aluminum before rolling and prior to hardening

Pressure variation along the cassette



FURNATEMP

ISO 9001-2015 COMPANY

The Heat with Solutions

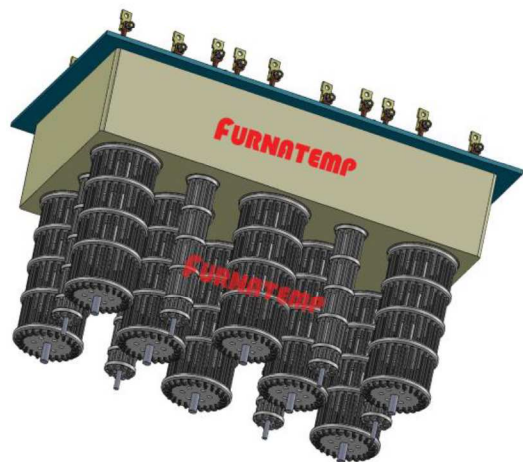
www.furnatemp.com

**The most efficient method of heating
air/gas up to 800°C in industrial heating
system**

- Maximum surface area should be in contact with the convection current
- To accommodate more power in a unit area
- Modular construction
- Draw in and draw out method will ensure faster online repair work with minimum interruptions
- Can load more than 90KW in a unit volume (m^3)



FURNATEMP DIFFERENT TYPES OF HEATING CASSETTES



FURNATEMP METATEK INDIA PRIVATE LIMITED

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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]			

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

