CARBOLITE®
a VERDER company

HIGH TEMPERATURE HORIZONTAL TUBE FURNACE - HTRH

The Carbolite high temperature tube furnaces HTRH can be used horizontally up to 1800 °C.

The high-grade insulation materials guarantee low energy consumption and high heating rates due to their low thermal conductivity. The insulation and molybdenum disilicide ($MoSi_2$) heating elements are installed in the rectangular housing. The heating elements are vertically hanging and can be replaced easily. At higher temperatures and in the presence of oxygen, $MoSi_2$ develops an oxide (SiO_2) layer, which protects the heating elements against further thermal or chemical corrosion.

Three-zone tube furnaces (HTRH-3) can achieve better temperature uniformity than single-zone versions. In these models each zone is equipped with a dedicated thermocouple and controller, which is especially useful to preheat gases required for reactions inside the system.

The HTRH tube furnaces do not include an integral work tube. The work tube must be selected as an additional item. The work tube length is dependent on the application and will vary if used with or without modified atmosphere or vacuum.

APPLICATION EXAMPLES

CIM, CVD, MIM, ageing, annealing, brazing, calcination, catalyst research, coating, degassing, drying, fuel cell testing, hardening, miniplants, pyrolysis, sintering, soldering, sublimation, synthesis, tempering, thermocouple calibration

STANDARD FEATURES

- 1800 °C maximum operating temperature
- Programmable temperature controller with 24 segments: HTRH fitted with EPC3016P1, HTRH-3 fitted with CC-T1
- Over-temperature protection
- Accepts work tubes with outer diameters up to 100 mm for use with modified atmosphere
- Accepts work tubes with outer diameters up to 200 mm for use in air
- Heated lengths of 100, 150, 250, 300, 600 or 900 mm
- Low thermal mass ceramic fibre insulation
- High quality $MoSi_2$ heating elements in a vertical, hanging position
- Rectangular housing with holes for convection cooling
- Available with 1 - 3 heating zones
- Furnace comes with separate control box with 3 m cable, plug and socket
- Ethernet communications

OPTIONS (*SPECIFY THESE AT TIME OF ORDER*)

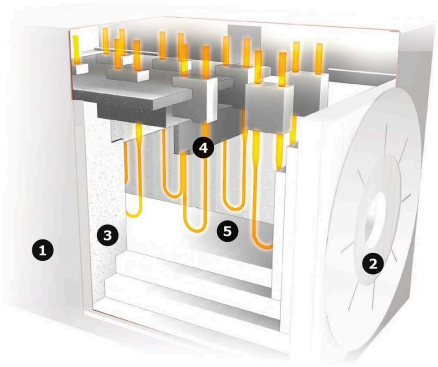
- A range of sophisticated digital controllers, multisegment programmers and data loggers with digital communication options is available - more information about controllers
- A range of additional work tubes is available in a variety of materials
- Insulation plugs & radiation shields are strongly recommended for high temperature vertical tube furnaces to prevent heat loss & improve uniformity
- Modified atmosphere and vacuum assemblies are available - more information
- Vacuum packages with a choice of rotary vane pump or turbomolecular pump are available for furnaces with tube inner diameters of 60 mm and above
- Oxygen sensor for inert gas packages
- Gas packages with manual or automatic valve for up to 3 gases
- 6 m long cable between furnace body and control box with plug and socket

HIGH TEMPERATURE HORIZONTAL TUBE FURNACE - HTRH

TECHNICAL DETAILS

View inside

1. outer case
2. ceramic fibre end insulation
3. ceramic fibre case insulation
4. heating elements
5. ceramic fibre inner insulation



View inside

EXAMPLES

HTRH 18/40/100 with control box

HTRH 17/70/600 with optional inert gas package, high vacuum flanges and E3508P10 programmer

Content may be subject to modifications or corrections

TECHNICAL DETAILS (MODELS)

	HTRH __/40/100	HTRH __/40/250	HTRH __/40/500
Max temp (°C)	1600	1600, 1700, 1800	1600, 1700, 1800
Number of heated zones	Single zone	Single zone	Single zone
Max outer diameter accessory tube (mm)	40	40	40
Heated length (mm)	100	250	500
Dimensions: External H x W x D (mm)	510 x 390 x 420	510 x 420 x 540	510 x 420 x 790
Furnace weight (kg)	45	45	60
Tube length for use in air (mm)	380	530	780
Tube length for use with modified atmosphere (mm)	915	1065	1275
Control module dimensions H x W x D (mm)	500 x 550 x 700	500 x 550 x 700	850 x 550 x 700
Control module weight (kg)	50	50	90
Uniform length ±5°C (mm)	50	125	250
Max power (W)	2200	3600	8000

	HTRH __/70/150	HTRH __/70/300	HTRH __/70/600
Max temp (°C)	1600, 1700	1600, 1700, 1800	1600, 1700, 1800
Number of heated zones	Single zone	Single zone	Single zone
Max outer diameter accessory tube (mm)	70	70	70
Heated length (mm)	150	300	600
Dimensions: External H x W x D (mm)	620 x 520 x 450	620 x 520 x 590	620 x 520 x 890
Furnace weight (kg)	65	65	90
Tube length for use in air (mm)	440	580	880
Tube length for use with modified atmosphere (mm)	975	1115	1415
Control module dimensions H x W x D (mm)	500 x 550 x 700	850 x 550 x 700	850 x 550 x 700
Control module weight (kg)	60	60	90
Uniform length ±5°C (mm)	75	150	300
Max power (W)	4500	6400	8000

	HTRH __/100/150	HTRH __/100/300	HTRH __/100/600
Max temp (°C)	1600	1600, 1700, 1800	1600, 1700, 1800
Number of heated zones	Single zone	Single zone	Single zone
Max outer diameter accessory tube (mm)	100	100	100
Heated length (mm)	150	300	600
Dimensions: External H x W x D (mm)	620 x 520 x 450	620 x 520 x 590	620 x 520 x 890
Furnace weight (kg)	75	90	140
Tube length for use in air (mm)	440	580	880
Tube length for use with modified atmosphere (mm)	975	1115	1415
Control module dimensions H x W x D (mm)	500 x 550 x 700	850 x 550 x 700	850 x 550 x 700
Control module weight (kg)	60	90	90
Uniform length ±5°C (mm)	75	150	300
Max power (W)	4800	7500	10900

	HTRH __/150/600	HTRH __/200/600	HTRH-3 __/70/600
Max temp (°C)	1600, 1700, 1800	1600, 1700, 1800	1600, 1700, 1800
Number of heated zones	Single zone	Single zone	Three zone
Max outer diameter accessory tube (mm)	150	200	70
Heated length (mm)	600	600	600
Dimensions: External H x W x D (mm)	670 x 570 x 890	720 x 620 x 890	620 x 890 x 520
Furnace weight (kg)	140	180	120
Tube length for use in air (mm)	880	880	880
Tube length for use with modified atmosphere (mm)	-	-	1415
Control module dimensions H x W x D (mm)	850 x 550 x 700	850 x 550 x 700	850 x 550 x 700
Control module weight (kg)	90	90	180
Uniform length ±5°C (mm)	-	-	350
Max power (W)	12000	12000	8000

	HTRH-3 __/100/600	HTRH-3 __/100/900	HTRH-3 __/150/600
Max temp (°C)	1600, 1700, 1800	1600, 1700, 1800	1600, 1700, 1800
Number of heated zones	Three zone	Three zone	Three zone
Max outer diameter accessory tube (mm)	100	100	150
Heated length (mm)	600	900	600
Dimensions: External H x W x D (mm)	620 x 890 x 520	680 x 1190 x 650	670 x 890 x 570
Furnace weight (kg)	120	250	180
Tube length for use in air (mm)	880	1180	880
Tube length for use with modified atmosphere (mm)	1415	1715	-
Control module dimensions H x W x D (mm)	850 x 550 x 700	1100 x 1200 x 700	850 x 550 x 700
Control module weight (kg)	180	230	180
Uniform length ±5°C (mm)	350	-	350
Max power (W)	10900	20000	12000

	HTRH-3 __/150/900
Max temp (°C)	1600, 1700, 1800
Number of heated zones	Three zone
Max outer diameter accessory tube (mm)	150
Heated length (mm)	900
Dimensions: **External H x W x D (mm)**	680 x 1190 x 650
Furnace weight (kg)	250
Tube length for use in air (mm)	1180
Tube length for use with modified atmosphere (mm)	-
Control module dimensions H x W x D (mm)	1100 x 1200 x 700
Control module weight (kg)	230
Uniform length ±5°C (mm)	-
Max power (W)	20000

Please note

- Heat up rate when using a ceramic work tube must be limited to 5 °C/min
- The power supply is based on 200 – 240 V for 1 phase and 380 – 415 V for 3 phase power
- Minimum uniform length in horizontal furnace with insulation plugs fitted at 100 °C below max. temperature
- Maximum continuous operating temperature is 100°C below maximum temperature
- Further to the depth of the control module 150 mm for the power plugs and other plugs needs to be added

www.carbolite.com/htrh