



HIGH TEMPERATURE PUSHER FURNACES

The C.I. Hayes Model MY “Moly” Pusher Furnace is designed for high temperature applications, including sintering of powder metal parts typically between 2100°F-3000°F (1149°C-1650°C). The benefits of liquid phase sintering, as well as producing metallurgical structures associated with the final stage of sintering, are realized. The sintered product gains improved mechanical and physical properties, such as ductility, impact, toughness and strength.

Parts, placed on saggars or in boats, are indexed through the furnace by a proven and reliable pusher mechanism positioned at the front of the furnace. The saggars or boats are typically pushed in trainlike fashion through the various sections of the furnace including preheat, high heat and cooling sections. Often, a return conveyance system is provided to return parts to the loading end and/or to stage parts prior to processing.

Drive System

The indexing drive system consists of a pusher mechanism and, optionally, a return conveyance system. The push rod of the indexing drive is extended by either a hydraulic cylinder or by a ball screw. The indexing length, time and speed of the push rod, as well as automation of doors opening/closing and the actions of the return system, are all managed by a logic controller.

Preheat/Delube Section

Saggars, or boats, are indexed through a preheat section that uniformly brings the parts to temperature. This section is generally rated at temperatures between 1600°F-1800°F (871°C-982°C). Metallic ribbon or wire type heating elements are positioned across the direction of travel, above and below the working area. A metallic muffle is typically provided in the preheat section to help direct the flow of atmosphere and lubricant vapors, removed from the parts during a delubrication process, out the front of the furnace.

High Heat/Sinter Section

The high heat section is isolated from the preheat section by an internal insulated throat area. It is heated with molybdenum rod elements that are positioned on either side of the work area. The elements extend beneath the elevated work hearth to provide an extremely uniform heating environment. Due to the elevated temperatures and dependent upon the working width, an arched high purity ceramic structure is provided for optimum strength designed to support the roof insulation.

Atmosphere System

The “MY” pusher furnace is provided with protective atmospheres. Hydrogen, a reducing gas, is most typical. An inert gas is used for safety purging purposes although it may be used to supplement the hydrogen as a process gas. The purge system is automatic and, with the main control system, provides many safety interlocks when working with a combustible atmosphere.

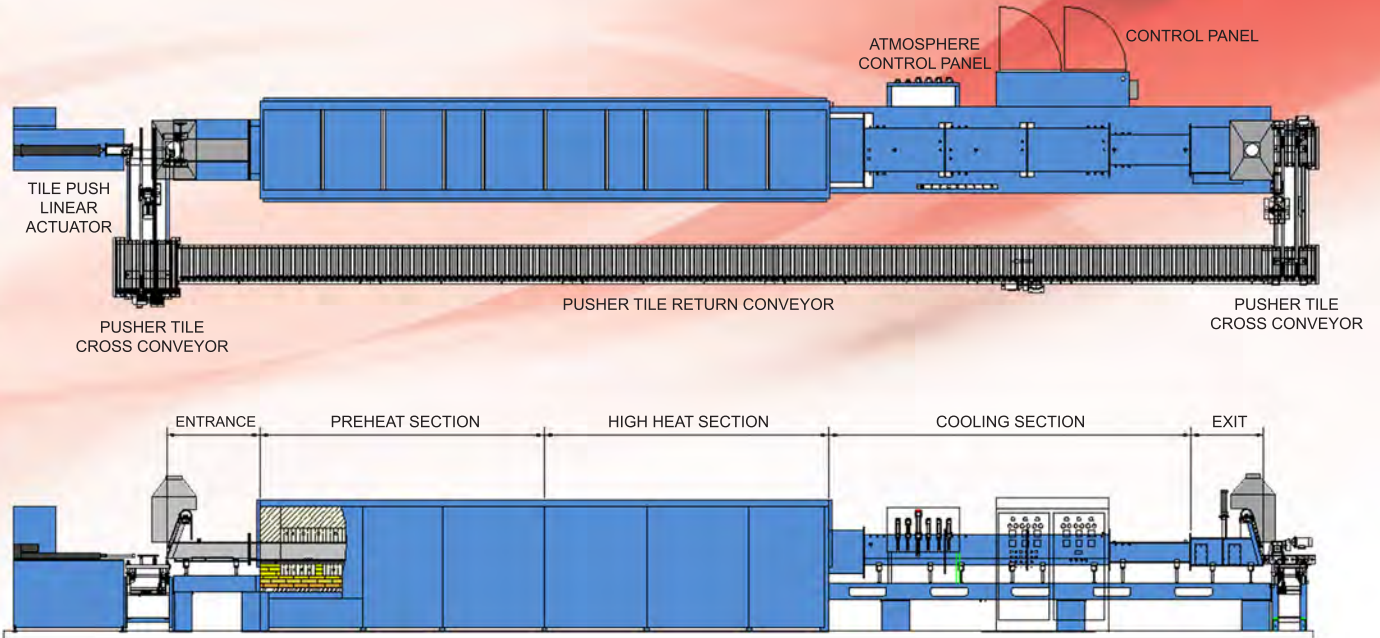
Control and Power System

The sequencing of the furnace, and sometimes zone temperatures, are managed by a programmable logic controller. Temperature is also managed by independent single loop controllers. The temperature controllers send proportioning signals to silicon controlled rectifiers (SCR) that regulate voltage and power to the elements. An HMI operator interface can be supplied for ease of setting furnace parameters as well as a means of acquiring important process data.

Component Design

Each area of the furnace has been carefully engineered for ease of equipment operation, maintenance and long life under full production conditions.

SPECIFICATIONS



Models:	Working Dimensions				Max Operating Temp	Floor Space Requirements			Connected Load	
	H	W	L (HH*)	L (PH**)		H	W	L	HH*	PH**
MY-040418	4"	4"	18"	-	3000°F	65"	83"	264"	15 KW	-
MY-040824	4"	8"	24"	-	3000°F	75"	50"	132"	25 KW	-
MY-030860-36PMH	3"	8"	60"	36"	3000°F	65"	72"	312"	40 KW	18 KW
MY-041296-72PMH	4"	12"	96"	72"	3000°F	72"	90"	480"	90 KW	45 KW
MY-0512120-96PMH	5"	12"	120"	96"	3000°F	72"	95"	504"	90 KW	45 KW
MY-0512120-144PMH	5"	12"	120"	144"	3000°F	72"	95"	588"	90 KW	60 KW

Models:	Working Dimensions				Max Operating Temp	Floor Space Requirements			Connected Load	
	H	W	L (HH*)	L (PH**)		H	W	L	HH*	PH**
MY-040418	101mm	101mm	457mm	-	1650°C	1651mm	2108mm	6705mm	15 KW	-
MY-040824	101mm	203mm	609mm	-	1650°C	1905mm	1270mm	3352mm	25 KW	-
MY-030860-36PMH	76mm	203mm	1524mm	914mm	1650°C	1651mm	1828mm	7924mm	40 KW	18 KW
MY-041296-72PMH	101mm	304mm	2438mm	1828mm	1650°C	1828mm	2286mm	12192mm	90 KW	45 KW
MY-0512120-96PMH	127mm	304mm	3048mm	2438mm	1650°C	1828mm	2413mm	12802mm	90 KW	45 KW
MY-0512120-144PMH	127mm	304mm	3048mm	3657mm	1650°C	1828mm	2413mm	14935mm	90 KW	60 KW

*HH = High Heat
**PH = Preheat

Custom-engineered sizes are also available upon request.

	Sinterite	C.I. Hayes	J.L. Becker
Continuous Belt Furnaces			
Sintering Furnaces	A	A	A
Brazing Furnaces	A	A	A
Steam Treat Furnaces	A		A
Annealing Furnaces	A	A	A
Austempering Furnaces			A
Normalizing			A
Stress Relief Furnaces			A
Tempering Furnaces	A		A
Mesh Belt Furnaces			A
Solid Belt Furnaces	A		
Cast Link Furnaces			A
Humpback Conveyor Furnaces	A	A	A
Other Continuous Furnaces			
Pusher Furnaces (2000°-3000° F)	A	A	
Pusher Furnaces (below 2000° F)			A
Roller Hearth			A
Walking Beam		A	A
Vacuum Furnaces			
Continuous & Modular		A	
Batch		A	
Integral, Gas, Pressure & Oil Quench		A	
Batch Furnaces			
Sintering Furnaces	A	V	
Carburizing Furnaces		V	A
Carbonitriding Furnaces			A
Normalizing Furnaces			A
Spheroidize Annealing Furnaces			A
Stress Relieving Furnaces			A
Brazing Furnaces	A	V	A
Annealing Furnaces	A	V	A
Tempering Furnaces	A	V	A
Box & Slot Furnaces (above 2000° F)			A
Steam Treat Furnaces	A		
Bell (Carbon) Furnaces	A		
Quenching Furnaces			A
Tip-Up Furnaces			A
Atmosphere Tip-Up Furnaces			A
Tempering Pit Furnaces			A
Carburizing Pit Furnaces			A
Nitriding Pit Furnaces			A
Car Bottom Furnaces			A
Tool Room Furnaces	A	V	
Atmosphere Generators			
Exothermic Gas up to 3000 CFH		A	A
Exothermic Gas up to 20000 CFH			A
Endothermic Gas up to 12000 CFH			A
Ammonia Dissociators up to 10000 CFH		A	A
Atmosphere Dryers		A	A
Quench Systems		V	A
Parts Washers			•
Charge Cars	•		•
Fabrications	•		•
Automation	•		•
Vacuum Impregnators	•		
Accelerated Delubrication Units	•		
Sinter Hardening/Accelerated Cooling Units	•		
Powder Handling Equipment	•		
Powder Blenders	•		
500# Barrel Dumpers	•		
Bulk Pack Inverters	•		
Powder Bag Hangers	•		
Furnace Load/Unloaders	•	•	•
Rebuild Services	•	•	•
Spare Parts	•	•	•
Training	•	•	•
Field Service	•	•	•

KEY
 A: Atmosphere
 V: Vacuum