

# G·M ENTERPRISES

A NITREX COMPANY



## VACUUM SYSTEMS FOR MIM APPLICATIONS



## MASTERING THE WORLD OF HEAT TREATING

In a fast-changing world that demands durability, sustainability, quality, and cost efficiency, more and more organizations, industries and applications are embracing heat treating as a mission-critical process. That's where we come in.

G-M ENTERPRISES is a leading heat treatment solution provider with over four decades of experience setting standards and defining strength. Our offering makes our customers' products and systems last longer, consistently performing better while meeting the highest standards.

## WE BUILD RELIABILITY

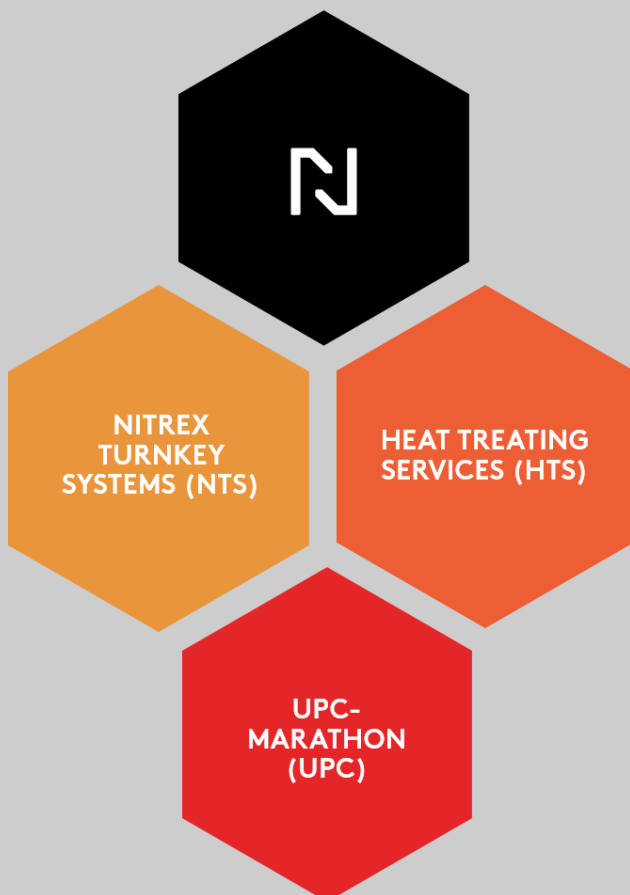
G-M Enterprises is a reliable partner that clients trust to meet their heat processing and application objectives with a variety of innovative solutions, timely manufacturing, and quality support services. From engineering to manufacturing, field service maintenance/installation technical groups, and after-market parts support, G-M Enterprises adds value to every system.

Our high-temperature vacuum furnaces and hot zones are developed and proven for all types of heat-treating applications from simple steel to high-temperature nickel-based alloys and titanium and a variety of industries, including aerospace, nuclear, power turbine, medical, tool and dies, MIM, and 3D additive, among others.

# OUR STORY TODAY

At G-M Enterprises, we are always looking for new ways to provide customers with the best services and product offerings. Through our affiliation with NITREX and its global network of companies, G-M customers now have access to a full breadth of products, services, and scalable solutions — from turnkey vacuum systems to nitriding/nitrocarburizing systems, process and flow controls, automation solutions, as well as heat treating services — that will ensure we keep pace with their evolving needs and expectations.

Together, we are MASTERING THE SCIENCE OF HEAT TREATING.



## SERVING THE COMMERCIAL AND CAPTIVE HEAT TREATING INDUSTRY

**Nitrex Turnkey System (NTS)**, a leader of turnkey nitriding, nitrocarburizing and vacuum heat treat systems.

**Heat Treating Services (HTS)**, a worldwide network of commercial heat-treating service centers.

**UPC-Marathon**, a leading provider of controls upgrade and automation solutions for heat treating and combustion industries.



# HVF SERIES

## THE INDUSTRY'S WORKHORSE

The HVF Series ensures industry-leading dependability with the most robust and energy-efficient vacuum furnace design in the market. Designed for horizontal front loading applications, the HVF is capable of running standard processes including hardening, annealing, tempering, brazing, **debinding and sintering**.

GM Enterprises' HVF series is **optimized for MIM applications**, where debinding and sintering happen in one step to prevent part distortion and achieve good mechanical properties of the processed metal parts. The system is engineered with multiple oversized binder traps to capture huge loads of binder from multiple cycles. When the trap is full, the control system notifies operators and automatically switches to the next available trap. Binder traps can be changed even during an active cycle of the process. An important time-saving feature of the GM Enterprises vacuum furnaces is the high-capacity dry/wet vacuum pumping system that shortens the process cycle and increases work efficiency.



**WE MAKE THINGS  
DEPENDABLE**



**NEVER COMPROMISE  
ON QUALITY**

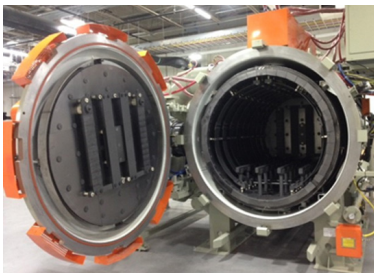


**WHEN MEETING YOUR  
DEADLINE IS ESSENTIAL**



MODEL SIZE	STANDARD SIZE LOAD W X H X D		ALTERNATE SIZE LOAD W X H X D		GROSS LOAD CAPACITY	
	INCHES	MILLIMETER	INCHES	MILLIMETER	LBS @ 2400°F	KG @ 1315°C
HVF 301-B	36x30x48	914x762x1219	44x10x48	1118x254x1219	2000	909
HVF 301-XB	36x30x60	914x762x1524	44x10x60	1118x254x1524	2250	1023
HVF 301-XXB	36x30x72	914x762x1829	44x10x72	1118x254x1829	2500	1136

# THE DEBINDER/SINTER FURNACE OF CHOICE FOR MIM APPLICATIONS



Furnace volumes range 30-60 ft<sup>3</sup> (850 -1,700 L) with hearth capacity of 2,000-4,400 lb. (910-2,000 kg)

Removable parts fixturing racks for reduced load/unload time



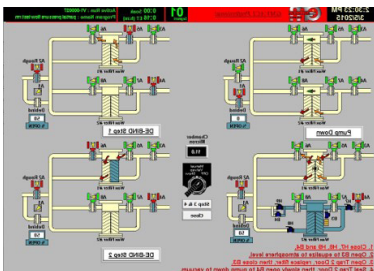
Superior hot zone design with longer life cycle and reduced maintenance

High capacity dry/wet vacuum pumping systems for shorter process cycles



Multiple oversized binder traps capture multiple cycles or huge loads of binder

Captures 45-330 lb./cycle (20-150 kg/cycle) of binder

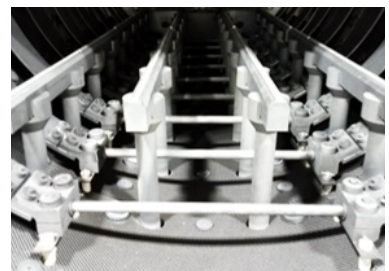


Control system with intuitive HMI and extensive diagnostic and reporting capabilities

Superior temperature control using multiple PID control ranges and 5 zones of eTrim power balancing



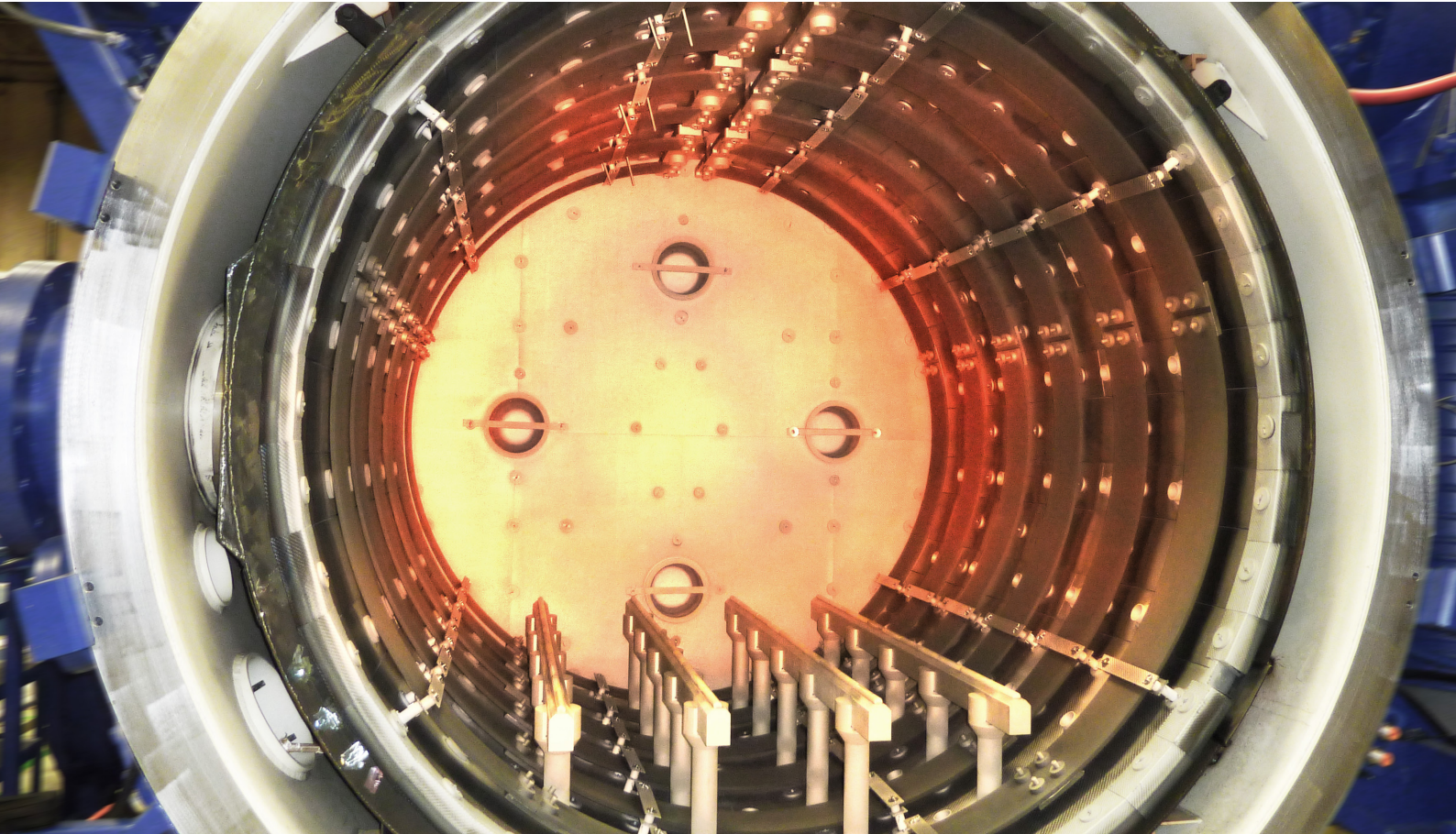
Furnace vessel with thick water jacket for better cooling performance



Heavy-duty heating elements and hearth construction for longevity and heavy load capacity



# HOT ZONES



The G-M aftermarket team has the experience and capabilities to tackle both the repair, rebuild, and upgrade of hot zones of most vacuum furnace brands.

Our hot zones are the industry's workhorses, designed to outperform competitive offerings with a lower cost of ownership. We can deliver a more durable, cost-effective, and thermally efficient alternative even for the most difficult processing applications. Whether it's a standard or custom-engineered hot zone with graphite or all-metal construction, G-M can build it better than the original.

## THE G-M ADVANTAGE

- One-piece, double-wall plenum design provides a high-efficient, more uniform cooling gas flow
- Built of 30% thicker sheet metal assures structural integrity and eliminates distortion
- Patented screw-in venturi nozzles surround the hot zone for higher velocity with better and more uniform gas distribution
- Easily replaceable and repairable parts, easy maintenance, and longer component life



# MASTERING THE SCIENCE OF HEAT TREATING.

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**MASTERING STRENGTH. WORLDWIDE.**

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