

MIDWEST THERMAL - VAC



Founded in 1999 by Fred Otto, Midwest Thermal-Vac has become a leader in vacuum carburizing for the Aerospace, Motor sports, and Commercial Industries with multiple quenching capabilities to handle just about any commercial material.

Midwest Thermal-Vac has also successfully demonstrated consistent repeatability of predictable results for new materials such as:

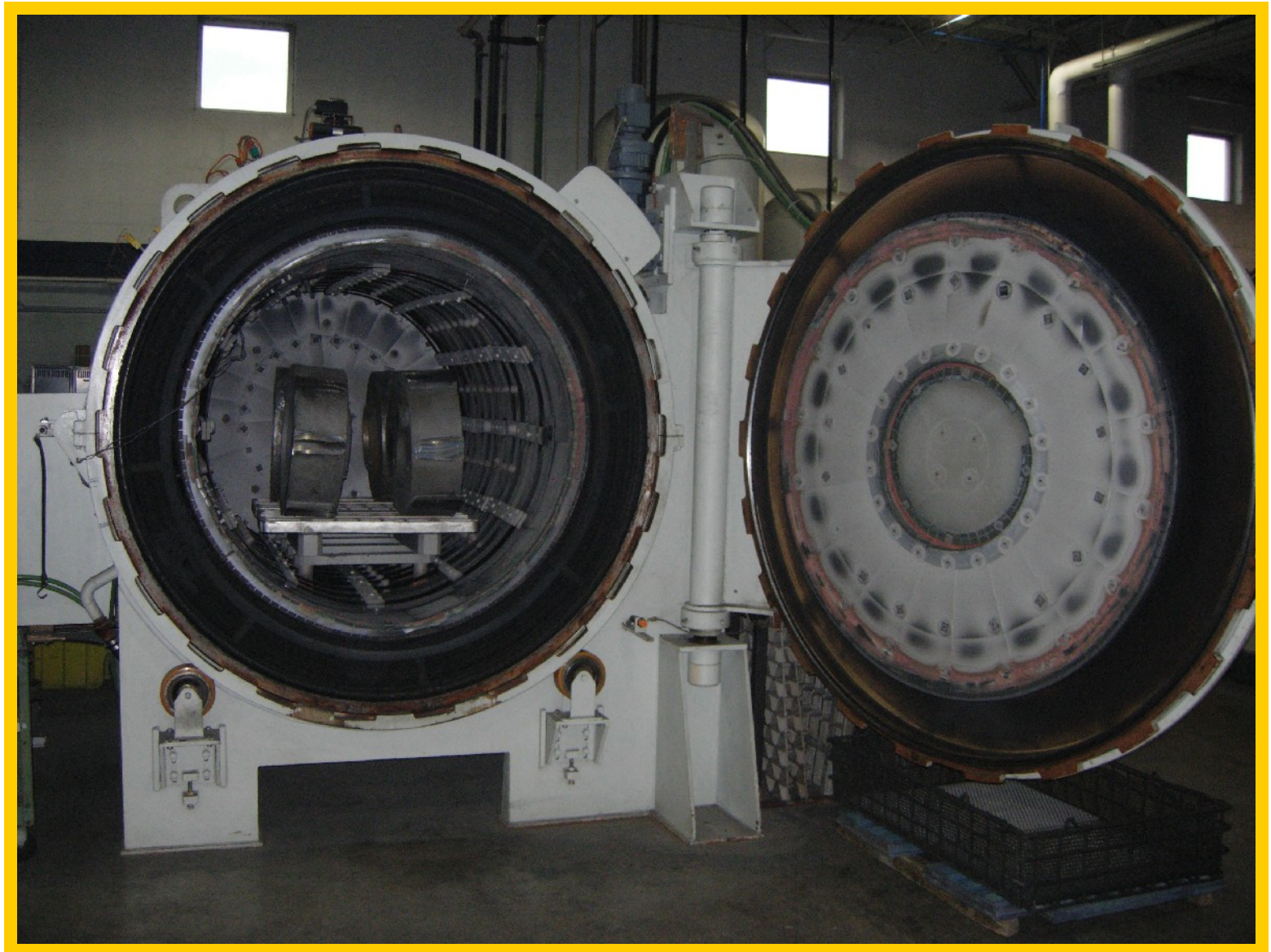
Aubert & Duvall X12 VDW and XD15NW
Questek In. Ferrium C61, CS62, S53, C69 & M60S
Timken Company's CSS-42L, CSB-50NIL, CBS-600 and BG42VIM
CarTech AerMet 100
Teledyne Corp. VascoMax C-250, 300 and 350

By taking advantage of the newest technology available today, Midwest Thermal-Vac is able to effectively provide it's customers the opportunity to utilize the latest streamlined manufacturing process improvements within the industry. This has been shown to yield increased quality in the heat treatment process and a decrease in overall production costs.

Currently Midwest Thermal-Vac has a 4 cell ICBP furnace with internal oil quench and 22 bar Gas Quench capabilities



Midwest Thermal-Vac has a horizontal single cell low vacuum furnace with high pressure gas quench capabilities.



Midwest Thermal-Vac has a horizontal single cell low vacuum tempering furnace.

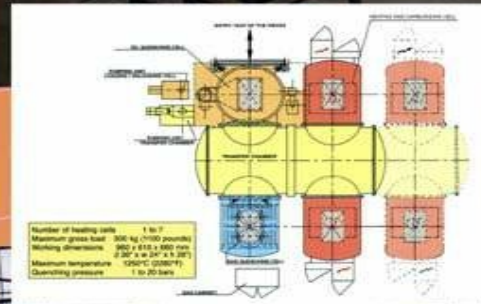


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Midwest Thermal-Vac has a full on-site Laboratory for complete heat treating analysis



HORIZONTAL INSTALLATION ICBP H



HORIZONTAL INSTALLATION TYPE ICBPH TG

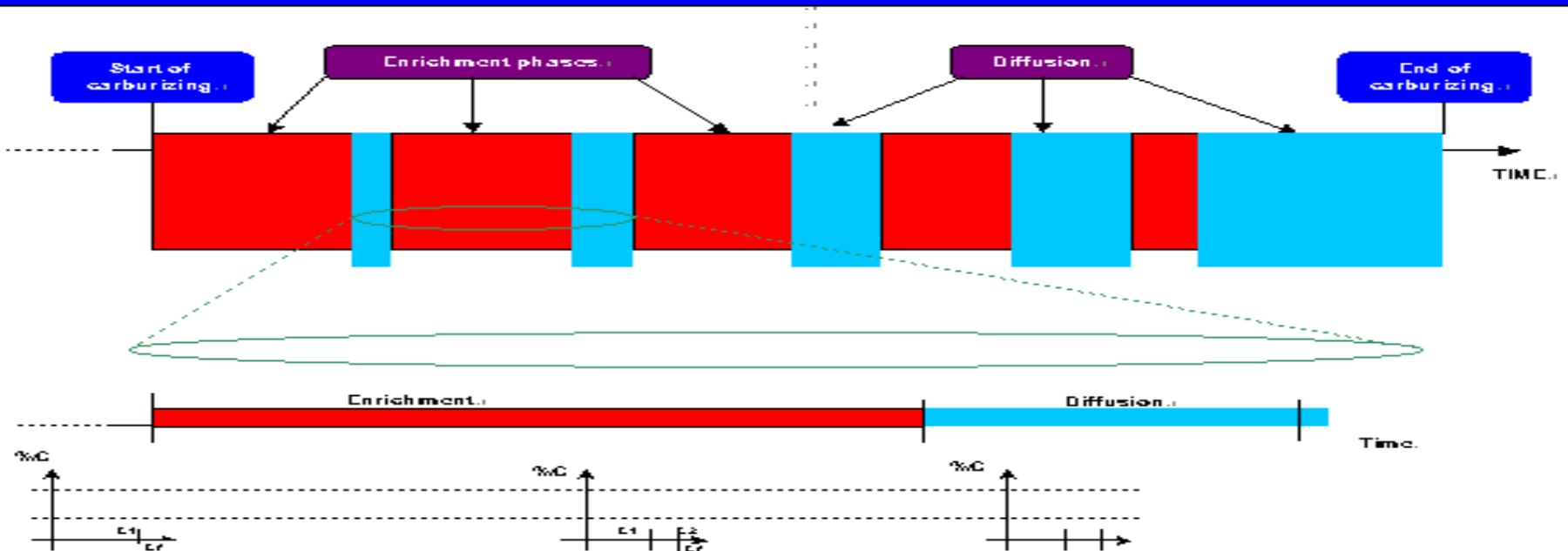


PRODUCTION CAPABILITIES

	Temperature range	Specificity
, COLD WALL VACUUM FURNACES GRAPHITE THERMAL CHAMBER	800 ~ 1200 °C	ARRAY of GAS INJECTORS around the LOAD
, GAS INJECTION 5 to 15 mbars	(PROPANE) (ACETYLENE) (NITROGEN)	ALTERNATE INJECTION of the 2 GAS (CARBURIZING / DIFFUSION phases)

BOOST AND DIFFUSE PROCESS OF CARBURIZATION

OBTENTION OF CARBON PROFILE



HIGH PRESSURE GAS QUENCH

PURE NITROGEN up to 22 mbars abs.

The performances of these cells under pure N₂ permits a more uniform quenching and specified CORE HARDNESS in aerospace and automotive Industry applications :

A. BENEFITS:

□ □ LOWER DISTORSION LEVEL on the PARTS

MORE IMPORTANTLY:

② → NARROW DISPERSIONS /REDUCED TOLERANCES

📄 Part to part

📄 Batch to batch

□ □ VERY NICE COSMETIC ASPECT of the PARTS :

“Bright SILVER” color after heat treatment

CONSEQUENCES:

📄 REDUCED GRINDING → COST SAVING

📄 PROCESS SIMPLIFIED → NO WASHING AFTER H.T.

ADVANTAGES OF THE "INFRACARB" PROCESS AND MODULAR PLANT *ICBP*

A. BETTER OVERALL QUALITY

- ☐ ☐ Metallurgical quality.
- ☐ ☐ Less distortion with gas quenching
and better reproductibility
- ☐ ☐ Nice cosmetic aspect of the parts: SILVER color.
- ☐ ☐ Perfect reproductibility of the treatment.
- ☐ ☐ Precise quality control through computer supervision.

B. ENHANCED PRODUCTION FLOW AND LOGISTICS

C. MORE FLEXIBILITY

D. ENHANCED PRODUCTIVITY

METALLURGICAL QUALITIES

, ABSENCE OF INTERGRANULAR OXIDATION

- ➔ HARDNESS DROP NOT OBSERVED
- ➔ LESS PITTING
- ➔ GRINDING OF CEMENTED LAYER USELESS
- ➔ NO SCALE, NO SOOT, NO OXIDATION

, PERFECT CONTROL OF CASE DEPTH

- ➔ $\pm 5/100$ mm due to very short transition periods
(5 sec.) between C/D phases

, NO GRAIN GROWTH OBSERVED at HIGH TEMPERATURE (till 1 000 °C)

- ➔ due to FAST CYCLE

, PROTECTION OF CERTAIN AREAS AGAINST CARBURIZING IS POSSIBLE

- ➔ METALLIC SHUTTERS

- ➔ STOP OFF PAINT

, DEFORMATION

- ➔ In many cases, it has been shown and proved that the
"INFRACARB" process plus gas quenching have
reduced deformations drastically compared to conventional carburizing and oil quenching.