



V A C U U M F U R N A C E S

AT FIRST SIGHT



**Started in
1984**



**50 countries
5 Continents**



ISO 9001



**Close collaboration
with customers
and partners.**

- + AEROSPACE**
- + COMMERCIAL HEAT TREATERS**
- + IGT - INDUSTRIAL GAS TURBINES**
- + HEAT EXCHANGERS INDUSTRY**
- + SINTERING INDUSTRY**
- + ADDITIVE MANUFACTURING**
- + R&D AND LABORATORIES**



A row of large industrial vacuum chambers in a factory setting. The chambers are white and cylindrical, with large circular doors. They are arranged in a line, receding into the background. The floor is concrete, and there are some cables and equipment visible around the chambers. The lighting is industrial, with some bright spots and shadows.

COMPANY MILESTONES

TAV SINCE1984

Passion, technical knowledge and lot of bravery have given rise to
TAV TECNOLOGIE ALTO VUOTO.

Look further!





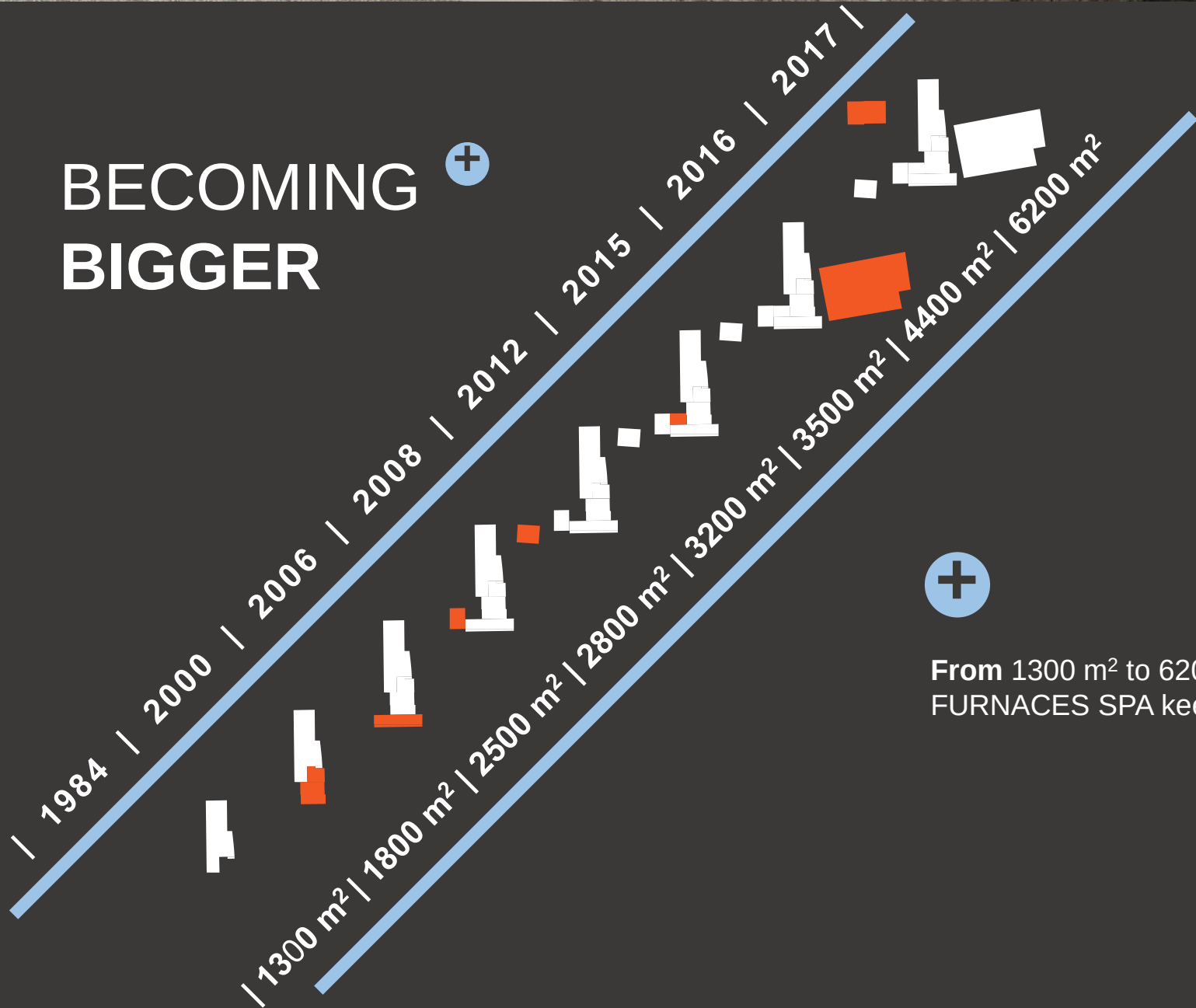
OUR CORE VALUES

Flexibility, technology and quality. These three core values have been driving us since 1984 make our company as market leader for vacuum furnaces. This is because of the trust obtained from small and large-sized companies on the international scene. Thanks to its top grade specialization in vacuum engineering, TAV VACUUM FURNACES can design and manufacture top quality vacuum furnaces for a wide range of industries and applications worldwide focusing on constant innovation.

R&D department in TAV VACUUM FURNACES is constantly working to ensure a tailor-made product according to customer needs, with regard to innovative technologies.

Thanks to our wide know-how in vacuum engineering, we provide customers with a team of professionals who can manage and solve all issues, ranging from design to manufacture, to project management, installation, technical assistance and training.

BECOMING BIGGER



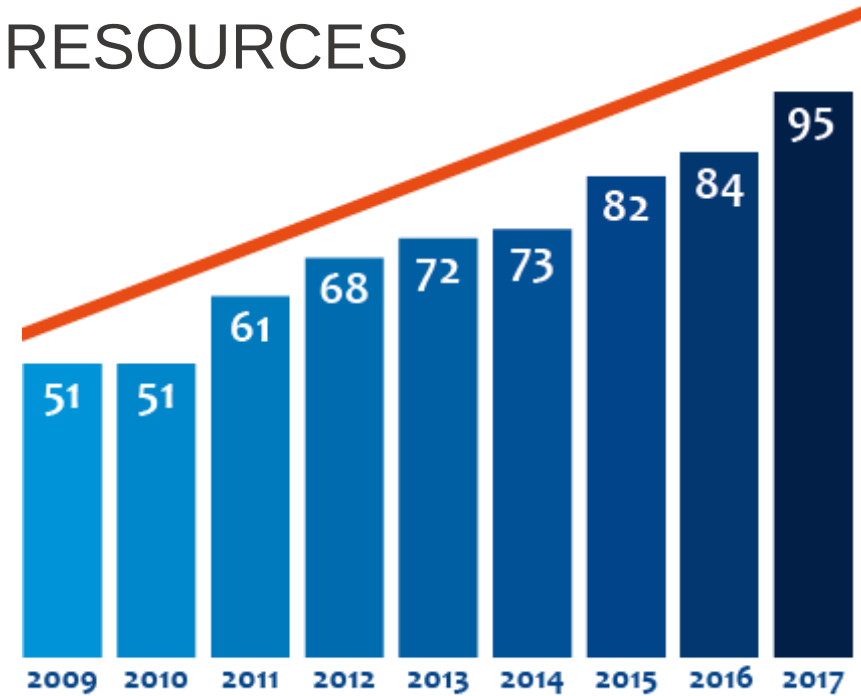
From 1300 m² to 6200 m² in 33 years. TAV VACUUM FURNACES SPA keeps on becoming bigger.



OUR GROWTH



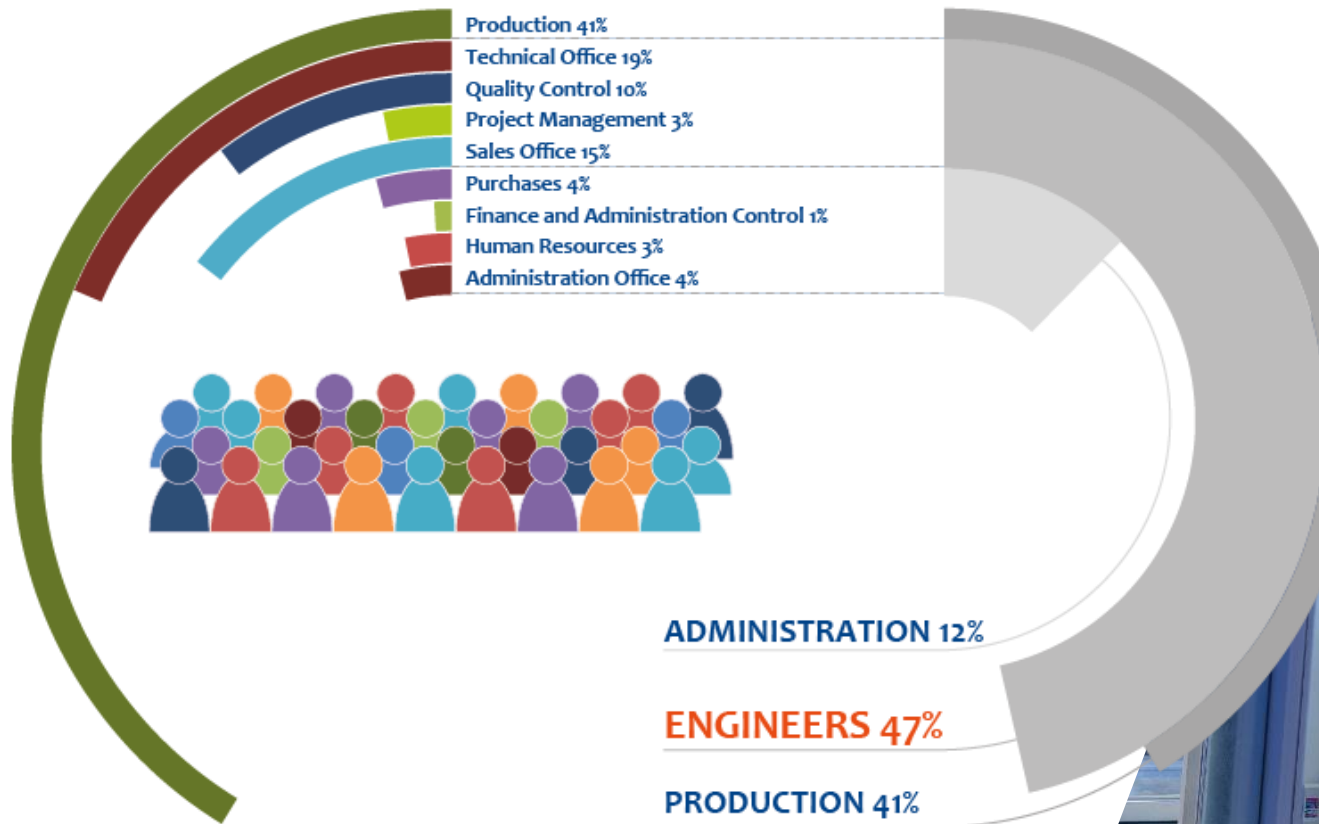
OUR MOST IMPORTANT RESOURCES



+ 86%

The people. In the last 8 years we grew up very fast. At the moment in TAV VACUUM FURNACES family we are 95 people and we want to keep growing.

OUR MOST IMPORTANT RESOURCES





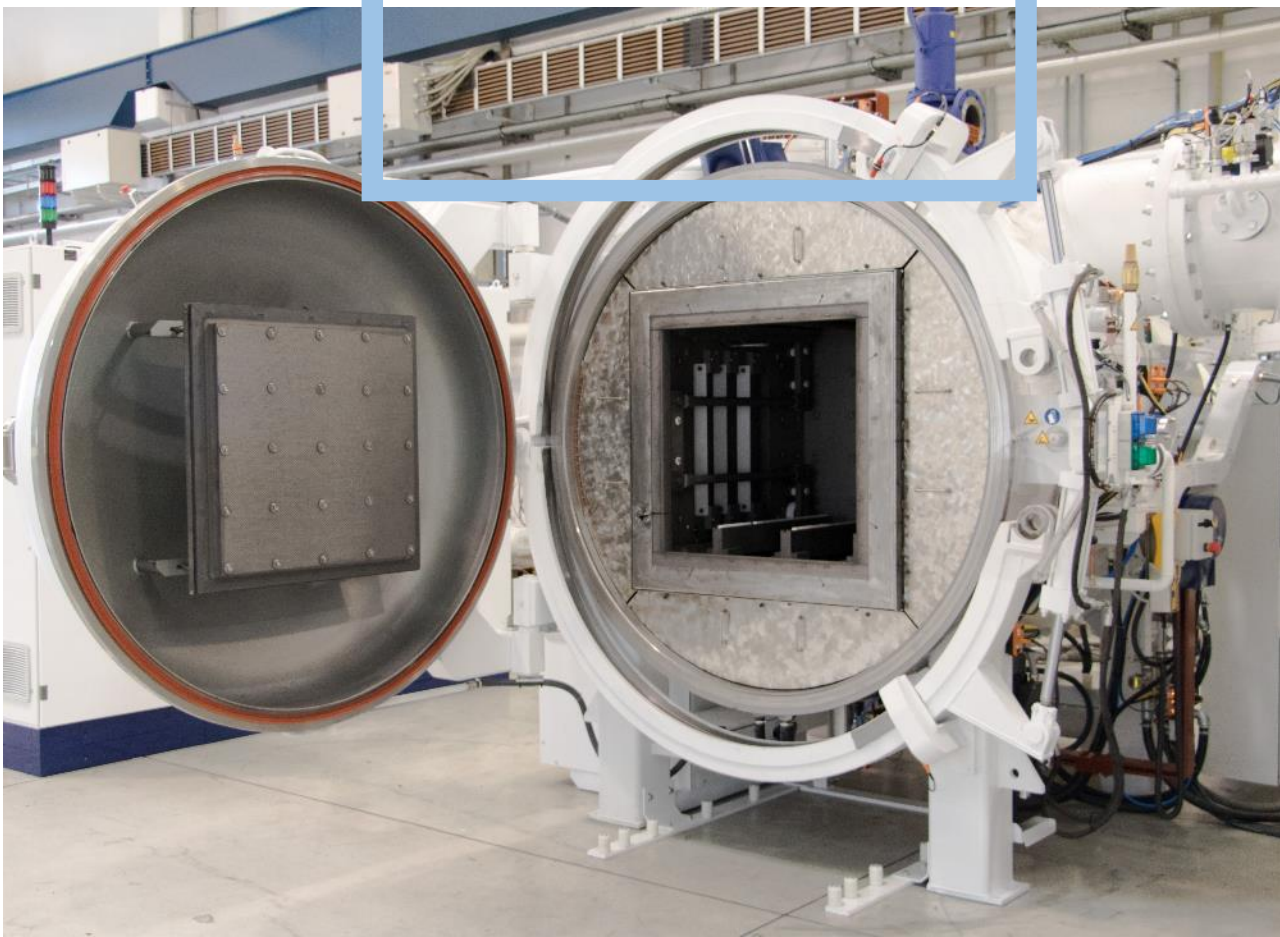
OUR VACUUM FURNACES

Meeting Your needs

Uncompromising research for quality and customer orientation are the basis of all TAV VACUUM FURNACES solutions. Each furnace is designed according to the specifications and meets the most strict criteria and procedures to ensure compliance with the most stringent industry specifications.



HINGED DOOR HORIZONTAL VACUUM FURNACE



- + LOADING FLEXIBILITY
- + CONVECTION HEATING
- + COMPACT DESIGN
- + MULTIPLE COOLING DIRECTIONS

In response to the rapidly changing market requirements, this is the best solution to meet the heat treating needs in the various fields of vacuum application.

Wherever speed, compactness, precision and reliability are required, this vacuum furnace provides customers with the most suitable answer in terms of automation and operational flexibility.

This configuration enables quick and easy loading of different charge volumes giving the flexibility required for various production and R&D applications.

CART DOOR HORIZONTAL VACUUM FURNACE

- + LARGE LOAD CAPACITY
- + LOADING THROUGH
OVERHEAD HALL CRANE
- + EASY THERMOCOUPLES
POSITIONING
- + BEST HEATING UNIFORMITY

For applications that require higher repeatability and reproducibility of the results, the vacuum cart door horizontal vacuum furnace is the cost-effective solution for large, dense loads.



A highly functional system for heat treatment (hardening and tempering, aging, stress relieving, solution treatments, annealing) as well as for brazing and diffusion bonding.

Perfectly suitable to move massive loads up to several hundred kilograms with maximum safety.



VERTICAL VACUUM FURNACE



- + EASY THERMOCOUPLES POSITIONING
- + LOADING THROUGH OVERHEAD HALL CRANE
- + HIGH LOADS
- + SMALL FOOTPRINT

Vertical furnaces provide a precise and accurate answer for vertical developed components to be subjected to thermal heat treatment, ensuring homogeneous temperature distribution even for complex geometries and very high load densities. The system is arranged for either top-loading or bottom-loading to further meet customer needs. Thanks to the vertical development of the system, its small footprint saves valuable space in the plant.

The constant, deep-rooted dedication to innovation has driven TAV VACUUM FURNACES to work out solutions meeting all customer needs, becoming one of the few vacuum furnace suppliers to manufacture vertical furnaces for vacuum heat treatment, vacuum brazing, advanced ceramics, UHV (Ultra High Vacuum) applications.

HORIZONTAL
FURNACES*

** Other dimension
are available*



MODEL	USEFUL DIMENSIONS (mm)			VOLUME (lt.)	LOAD (kg)	HEATING POWER (kW)
	W	H	L			
H2	200	200	300	12	25	40
H3	300	300	450	41	80	50
H4	400	400	600	96	200	90
H5	500	500	750	188	400	110
H6	600	600	900	324	600	150
H7	700	700	1050	515	800	180
H8	800	800	1200	768	1000	210
H9	900	900	1350	1094	1200	240
H10	1000	1000	1500	1500	1500	280
H12	1200	1200	1200	1728	2000	290
H15	1500	1500	1500	3375	3000	410

Useful Volume from laboratory size to **33,000 liters**
Max. Temperature up to **2250 °C**
Ultimate Vacuum up to **1E-7 mbar range**
Max. Pressure up to **60 bar abs**



VERTICAL FURNACES*

** Other dimension
are available*



MODEL	USEFUL DIMENSIONS (mm)		VOLUME (lt.)	LOAD (kg)	HEATING POWER (kW)
	Ø	H			
V10	1000	1000	785	1000	200
V12	1200	1200	1357	1200	250
V15	1500	1500	2651	1500	340
V18	1800	1800	4580	1800	450
V20	2000	2000	6283	2000	530

Useful Volume from laboratory size to **13,000 liters**
Max. Temperature up to **2500 °C**
Ultimate Vacuum up to **1E-7 mbar range**
Max. Pressure up to **150 bar abs**



APPLICATIONS



**VACUUM
HEAT TREATMENT**



**VACUUM
BRAZING**



**VACUUM
SINTERING**



**ADDITIVE
MANUFACTURING**

APPLICATIONS



**ADVANCED
CERAMICS**



**DIFFUSION
BONDING**



ALUMINIZING



**UHV
(Ultra High Vacuum)**

VACUUM HEAT TREATMENT

Heat treating is performed to improve the mechanical and/or chemical properties of materials. Thermal processing in a vacuum furnace ensures highly accurate and reliable results for materials having to withstand extreme operating conditions.

+ Treated materials:

Steels, superalloys, titanium, aluminium, copper, etc.

+ Industries:

Aerospace, IGT (Industrial Gas Turbines), commercial heat treaters, medical, automotive, tools industry, etc.



APPLICATION FIELDS

Hardening

Tempering

Annealing

Aging

Nitriding

Low Pressure
Carburizing

VACUUM BRAZING

Brazing in a vacuum furnace allows more accurate control of dimensional tolerances and provides clean joints with no need for additional finishing. Vacuum is especially suited for brazing of aluminium heat exchangers due to the absence of air, thus preventing the formation of oxides.

+ Treated materials:

Steels, superalloys, titanium, aluminium, copper, etc.

+ Industries:

Aerospace, IGT (Industrial Gas Turbines), heat exchangers, commercial heat treaters, medical, automotive, tools industry, research, etc.



APPLICATION FIELDS

Vacuum brazing
of aluminium
heat exchangers

Copper brazing
of stainless steel
heat exchangers

Nickel brazing of
stainless steel
heat exchangers

Special alloys
Brazing

VACUUM SINTERING

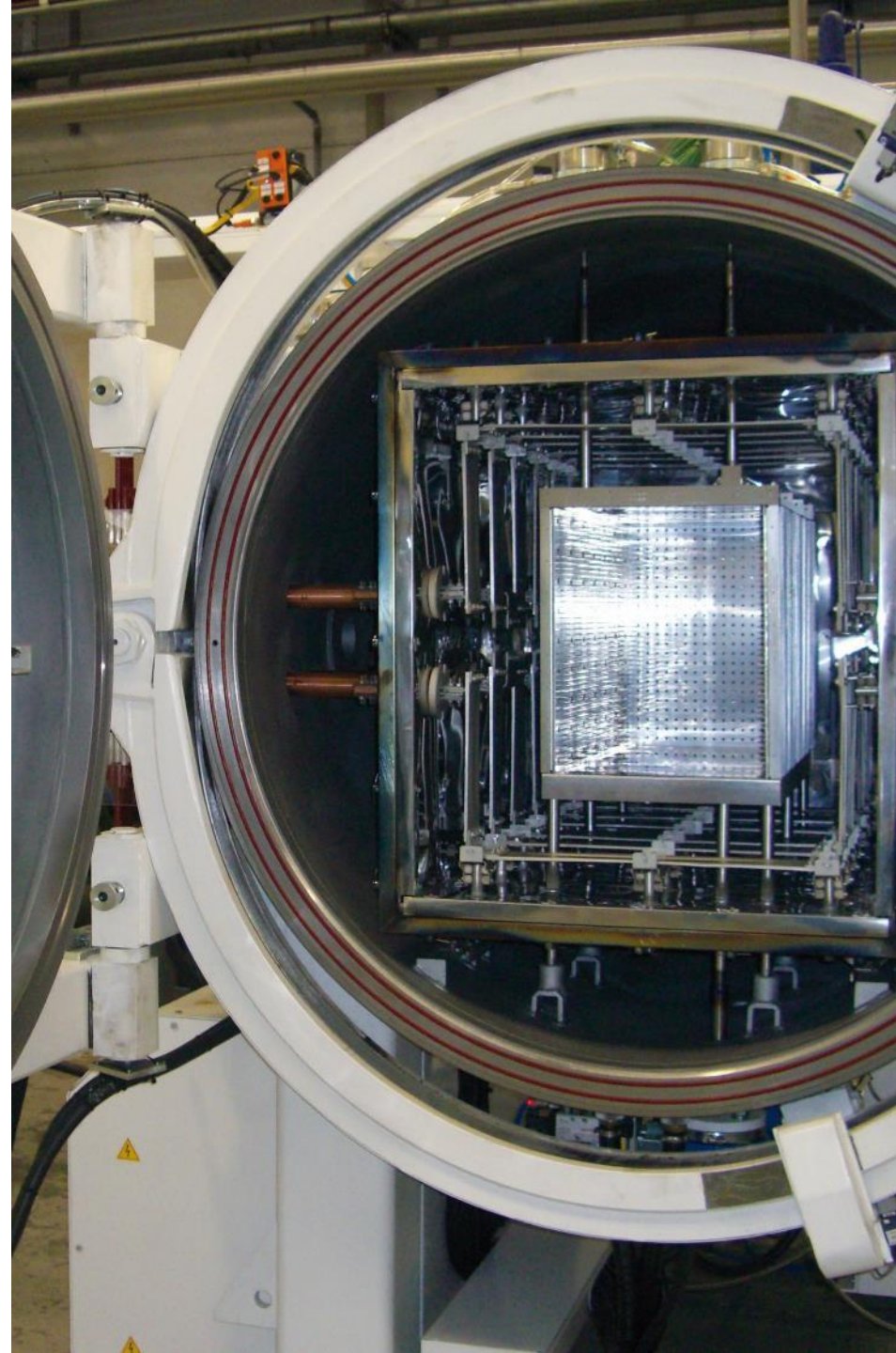
Sintering is a technology based on atomic diffusion which occurs much faster at high temperatures. Vacuum speeds up cycle time and guarantees temperature uniformity with more predictable results. Adjacent molecular particles surfaces of metallic powders can be bonded to the maximum possible density by vacuum hot pressing of the parts in the near-net-shape configuration. Vacuum provides the speed required for maximum productivity at lower consumption rates.

+ Treated materials:

Steels, titanium, copper, tungsten, Hard Metal, etc.

+ Industries:

Medical, automotive, precision mechanics, weapon, jewelry, eyewear, fashion, etc.



APPLICATION FIELDS

Sintering

MIM

Hard Metals

Sinter-HIP

ADVANCED CERAMICS

High-performance ceramics have exceptional mechanical properties in many respects including high temperature resistance and high wear resistance. They are used in a wide range of industrial applications.

+ Treated materials:

Alumina, SiC, Si₃N₄, B₄C,
AlN, BN, C/C, Liquid
Silicon Infiltration, etc.

+ Industries:

Automotive, aerospace,
research, etc.



FEATURES

Temperature:
up to 2500 °C

1E-1 ÷ 1E-2
mbar range

ALUMINIZING

The **aluminizing process** helps slowing down or stopping corrosion by protecting the surface of the component operating in corrosive and/or high temperature environments. Diffusion of aluminium within the surface of the blades is applied for industrial gas turbines and aero-engine turbines.

+ Treated materials:

Carbon steels, alloy steels, stainless steels, nickel-based alloys, nickel-iron alloys, etc.

+ Industries:

Turbine blades, etc.



TERMOCHEMICAL DIFFUSION PROCESS FOR

High temperature
resistance

Chemical attack
barrier

RETORT

Temperature:
1100 °C,
inert atmosphere

DIFFUSION BONDING

A **solid-state process** for joining two surfaces by the action of temperature and pressure . Weight saving is a significant benefit.
Typical applications are multiple-finned channels and honeycomb construction.

+ Treated materials:

Titanium, etc.

+ Industries:

Aerospace, research, etc.



APPLICATION FIELDS

Solid-state
welding technique

High pressure

High temperature

UHV (Ultra High Vacuum)

TAV manufactures high vacuum furnaces for ultra-clean and high temperature applications. Many processes in advanced research and industrial manufacturing must be operated in an ultra high vacuum environment. Vacuum is ideal for ultra-clean and high temperature applications which have extremely high quality requirements, such as semiconductor devices.

+ Industries:

Advanced brazing (nuclear research), high vacuum laboratory research, etc.



FEATURES

Vacuum
to 0.00001 Pa
(1E-7 mbar)

High temperature
applications
(up to 2500 °C)

Thermal chamber:
stainless steel,
molybdenum,
tungsten

ADDITIVE MANUFACTURING

Additive Manufacturing is a highly flexible technology that allows to manufacture 3D printed components by adding material layer by layer. The thermal process at high temperature in vacuum furnaces is the usual step after Additive Manufacturing Process. Additive Manufacturing uses materials at different states (powders, liquids, solids), including direct and indirect deposition technologies.

+ Treated materials:

Steels, titanium, ceramics, superalloys (chromium-cobalt, Inconel), etc.

+ Industries:

Aerospace, medical, automotive, jewelry/fashion, etc.



VACUUM THERMAL PROCESSES

Debinding & Sintering

Solution treatment

Stress relieving

ADDITIVE MANUFACTURING TECHNICS

Binder-Jetting

DMLS (Direct Metal
Laser Sintering)

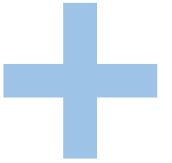
SLS (Selective
Laser Sintering)

SLM (Selective
Laser Melting)

WFMD (Wire Feed
Metal Deposition)

AFTER SALES

Worldwide



THE COMMISSIONING AND AFTER SALES SERVICES INCLUDE:

Through its large team of experienced engineers, supported by the most advanced surveying instrumentation, TAV VACUUM FURNACES and our partner companies TAVENGINEERING and FURNACARE (Canada, USA and Mexico), provide a timely and qualified assistance to its customers worldwide.



- Customer's staff training
- Maintenance programs
- Remote troubleshooting with state of the art computer analysis techniques
- Spare parts supply

WORLDWIDE PRESENCE





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V A C U U M F U R N A C E S

Flexibility Technology Quality

