



FURNACES FOR POWDER METALLURGY

Debinding

Sintering

Sinter Hardening

Powder Annealing

Steam Treatment

Heat Treatment

www.fluidtherm.com

















































Fluidtherm furnaces are shipped around the world



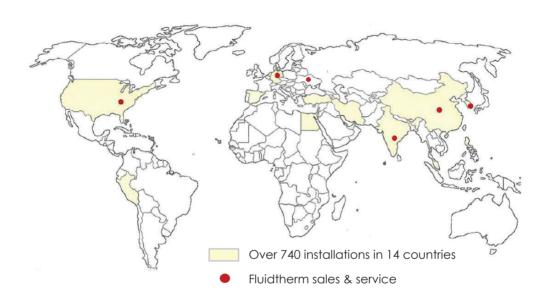


... by road, railway, sea

... and by air

Cover picture: Fluidtherm furnaces fill the shop floor at DKS, S. Korea as in several other factories Above: The logos represent a partial list of our worldwide customers

A TECHNOLOGICALLY ADVANCED MANUFACTURER OF INDUSTRIAL FURNACES





H.O & Factory: SP 132, III Main Road Ambattur Industrial Estate Chennai 600 058, India +91 44 2635390/ 1 info@fluidtherm.com

R&D + PROCESS PROTOTYPING

Fluidtherm has a strong focus on customer oriented R&D that ensures constant innovation of new products and processes that improve our customers' productivity, quality and process cost.

We operate a versatile thermal process prototyping laboratory that is engaged in

- o process prototyping and optimisation
- o customer training and troubleshooting
- o simulations and modeling
- o process & product development
- o failure analysis
- o expert consultation



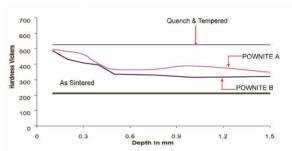
Process trials at Fluidtherm

INNOVATIVE PROCESS DEVELOPMENT

THE POWNITE® PROCESS

Properties of unalloyed sintered iron PM parts are improved by gas alloying with nitrogen (patent applied)



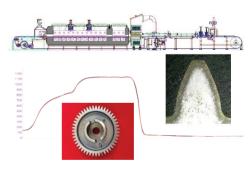


BOILERLESS STEAM TREATMENT



Boilerless steam treatment using humidified nitrogen; results in major energy savings and lower maintenance

CONTINUOUS CASE HARDENING BY GAS QUENCHING OF ALLOY PM PARTS

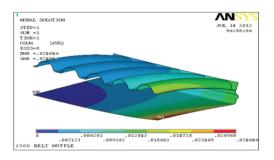


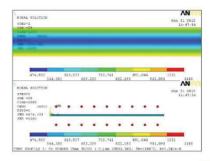
Continuous hardening by gas quenching at atmospheric pressure results in a well-defined hardened case with a soft core and good fatigue strength; eliminates oil quenching.

Pore oxidation by direct oxidant injection... In-line sintering & bainite hardening by gas quenching... New fluidised bed furnaces possibilities... MANY MORE!

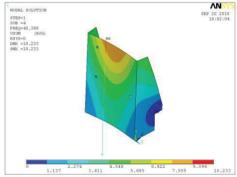
FURNACE MODELING

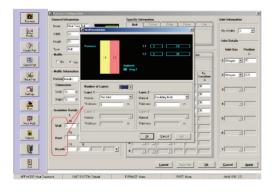
Design software and simulation are used to make great furnaces & ovens!

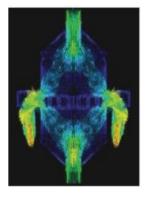




- o Structural and stress analysis
- o Thermal stress analysis
- o Transient thermal analysis
- o Rotor dynamic analysis
- Conjugate heat transfer (CFD)







PLANT & PROCESS CONTROLS

Fluidtherm furnaces are fully automated, generally with the use of PLC and PC with SCADA software and TPM maintenance scheduler. Our furnaces are fully compliant with all NFPA & EU safety directives, as applicable.

Standard & optional features include

- o predictive maintenance for increased uptime and furnace life
- o instant after-service by remote monitoring and program modification
- o audio visual alarms with SMS alerts
- easy diagnostics and troubleshooting
- o process data recording, analysis, presentation and archiving
- vision systems
- o auto start-up, shut down and FMEA derived interlocks



MESH BELT FURNACES

Sintering of iron and copper based parts













SINTER HARDENING FURNACES



Synchroniser hubs, sprockets, gears & pulleys

HIGH TEMPERATURE PUSHER & WALKING BEAM FURNACES

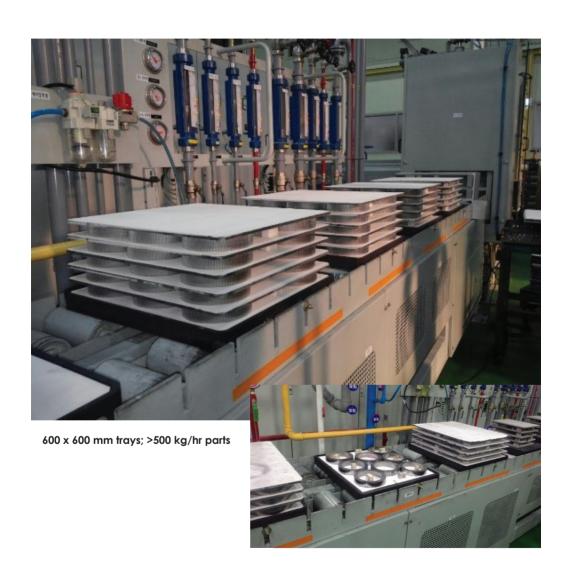
Sintering of iron and stainless steel parts





HIGH TEMPERATURE HIGH CAPACITY PUSHER FURNACES

Large structural parts



VERY HIGH TEMPERATURE PUSHER FURNACES

Sintering of tungsten alloys and nuclear fuels





HIGH TEMPERATURE PUSHER FURNACES

Sintering ceramics



LOW TEMPERATURE PUSHER FURNACES

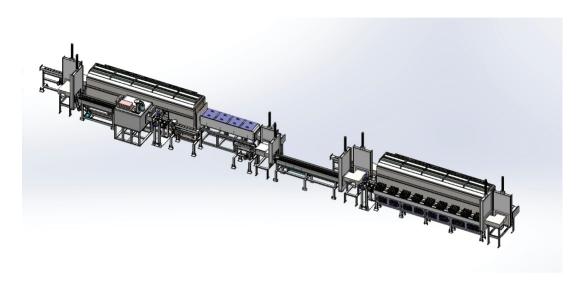
Sintering of aluminium parts



(-) 60°C dew point + <3 ppm O2 & ΔT of 2.5°C within the furnace results in high quality sintered aluminium parts

LOW TEMPERATURE PUSHER FURNACES

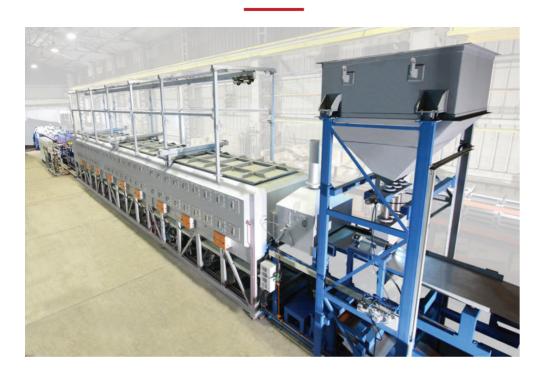
Porosity sealing followed by nitrocarburising





Nitrocarburising with nitriding potential (Kn) control

METAL POWDER REDUCTION & ANNEALING FURNACES







BIMETAL STRIP SINTERING FURNACES



BUILDING RELATIONSHIPS SINCE 1984ALSO FURNACES





SP 132, III MAIN ROAD, AMBATTUR INDUSTRIAL ESTATE, CHENNAI- 600 058, INDIA

TEL: +91 44 26357390/ 1 FAX: +91 44 26257632

info@fluidtherm.com www.fluidtherm.com





Fluidtherm Technology (P. Ltd) was promoted in 1985 by engineering professionals with significant prior experience in the thermal processing equipment industry. Fluidtherm employs 70 persons at its head office and works at Chennai, India. Apart from the infrastructure and operating system required to design, build and install industrial furnaces, Fluidtherm also possesses a versatile thermal processing facility and metallurgical laboratory.

Over the years, having gained a good reputation in Indian industry, Fluidtherm has developed extensive business with several German furnace manufacturers to whom whole or parts of furnaces are shipped and with whom strategic alliances have been formed. Fluidtherm furnaces have been installed in Germany, S. Korea, China, Spain, Denmark, Netherlands Turkey, Egypt. Malaysia, Peru, Iran & Indonesia other than over 700 installations in India.

PRODUCTION PROGRAM



MESH BELT SINTERING TYPE EDB



MESH BELT SINTERING TYPE RBO



MESH BELT SINTER HARDENING



ALUMINIUM SINTERING



1700°C HYDROGEN PUSHER



PUSHER FOR IRON PARTS



CONTINUOUS STEAM TREATMENT



IRON POWDER ANNEALING



PUSHER FOR SS PARTS



BIMETAL STRIP SINTERING



WALKING BEAM



CONTINUOUS HARDENING PLANTS

- **GRAPHITE TUBE PUSHER**
- BELL TYPE PRESS SINTERING
- BATCH STEAM TREATMENT
- FLUIDISED BED

- ELEVATOR HEARTH
- LAB SCALE MESH BELT & PUSHER
- GAS GENERATORS
- CONTROLLED POTENTIAL GAS NITRIDING

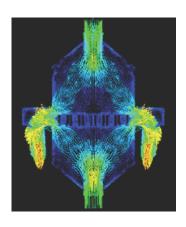
FLUIDTHERM OWNS & OPERATES A VERSATILE THERMAL PROCESS PROTOTYPING FACILITY & METALLURGICAL LABORATORY WHERE PROCESS METALLURGISTS WORK FULL TIME IN PRODUCT & PROCESS DEVELOPMENT



- Process prototyping
- Sample processing
- Failure analysis
- Metallurgical studies

- Customer training
- Retro-engineering
- Experimental simulation
- PhD (3), MTech (12) & BTech (25) research projects

Software Employed



- FLUENT Computational Fluid Dynamics (CFD) for heat transfer
- Thermal Ceramics Software for insulation modeling
- ANSYS for thermal & structural design analysis
- E Plan for control system design
- PRO CAD for plant piping & fluid flow
- ELEMENTATION for heating element design
- SOLIDWORKS for 3D modelling
- Furn Expert [®] for design verification
- Autocad for engineering drawings





www.fluidtherm.com

Works & Head Office

SP 132, III Main Road AIE Chennai-600 058 INDIA



High Temperature Pusher Furnaces

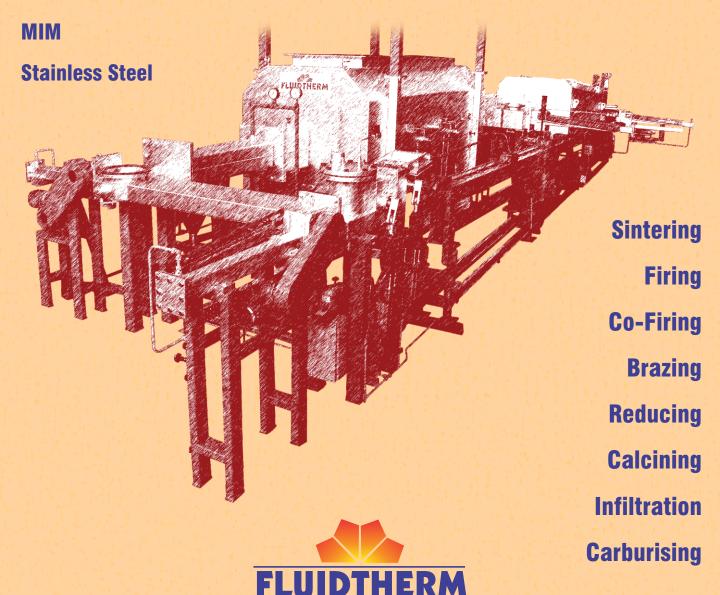
Up to 1750°C

Powder Metals

Refractory Metals

Ceramics

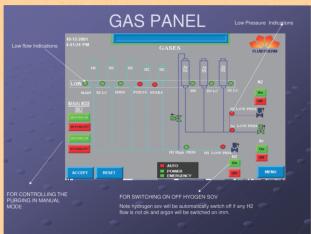
Hard Metals



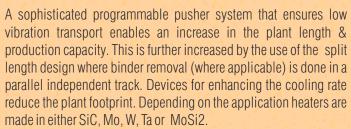
info@fluidtherm.com
www.fluidtherm.com

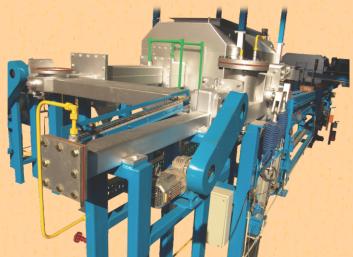
Fluidtherm high temperature (T Max 1700°C) pusher furnaces are designed & constructed by a dedicated crew of craftsmen whose expertise ensures that customers get the best possible value for money anywhere in the world (as of 2012). These furnaces are characterised by several features that maximise part quality, plant productivity, plant uptime & operating economy





An advanced SCADA system is used for plant monitoring & control, production management, maintenance scheduling and data presentation in several formats. This user friendly facility is viewed and supported through the internet.







Internal heat shields eliminate hot spots & promote temperature uniformity. Apart from better quality & dimensional consistency, this facility enables a higher stacking density & lower production cost. Furnaces that use prepared atmospheres (e.g. 100% Hydrogen) utilise specially engineered vacuum locks which keep the furnace atmosphere pure while reducing gas consumption. Gas tight internal doors allow use of different atmospheres in different sections of the furnace and isolate one section from the gases of another (for instance keeping binder fumes from the sintering section).

Fluidtherm Technology P. Ltd

SP 132,III Main Road. Ambattur Industrial Estate, Chennai- 600 058. India Phone: +91 44 2635 7390 Fax: +91 44 2625 7632

email: info@fluidtherm.com Website: www.fluidtherm.com