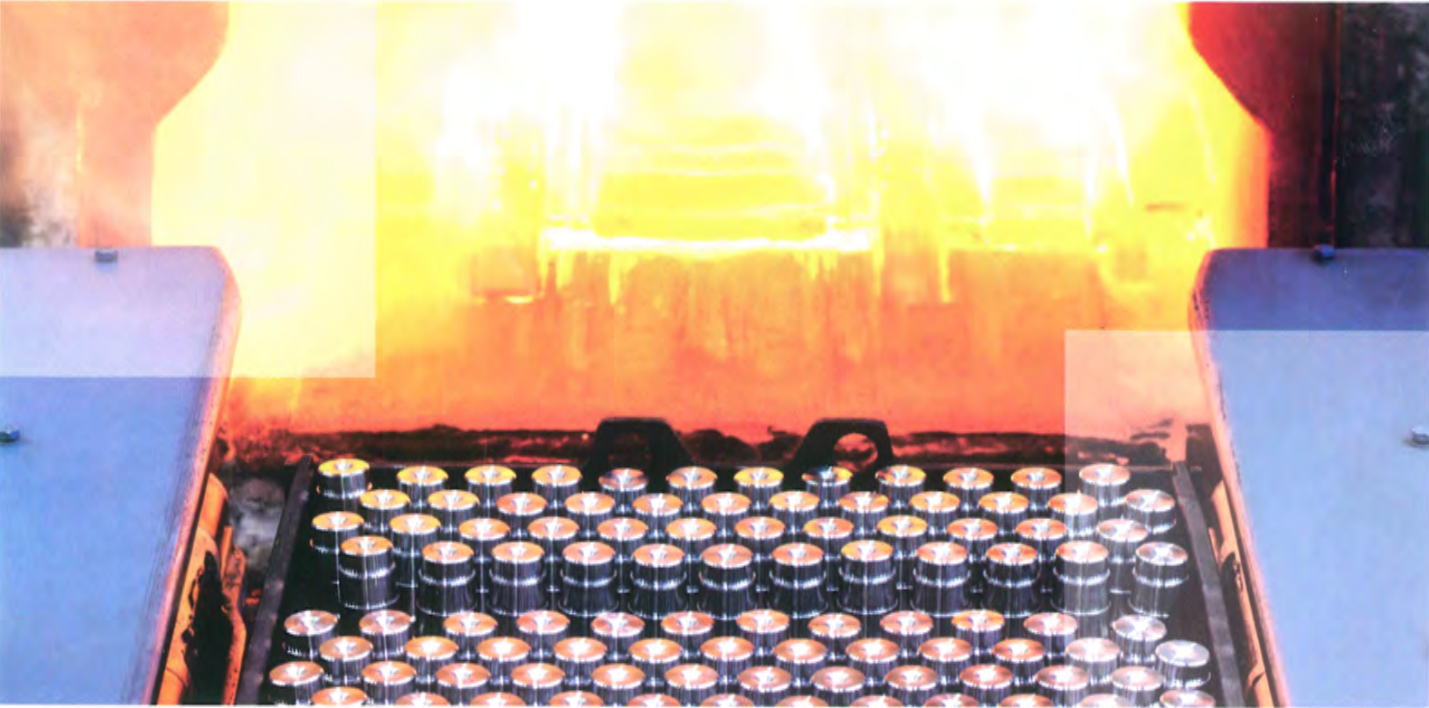




What you should know about
Ipsen's atmosphere technology.



So the atmosphere is correct – technically and economically.

Ipsen atmosphere furnaces are used in conventional heat treatment processes, that is to say for hardening, quench hardening and tempering, carburisation, carbon nitriding, nitro-carburisation, bright tempering and annealing. The technology involved is distinguished by its simple design and comparatively low costs.

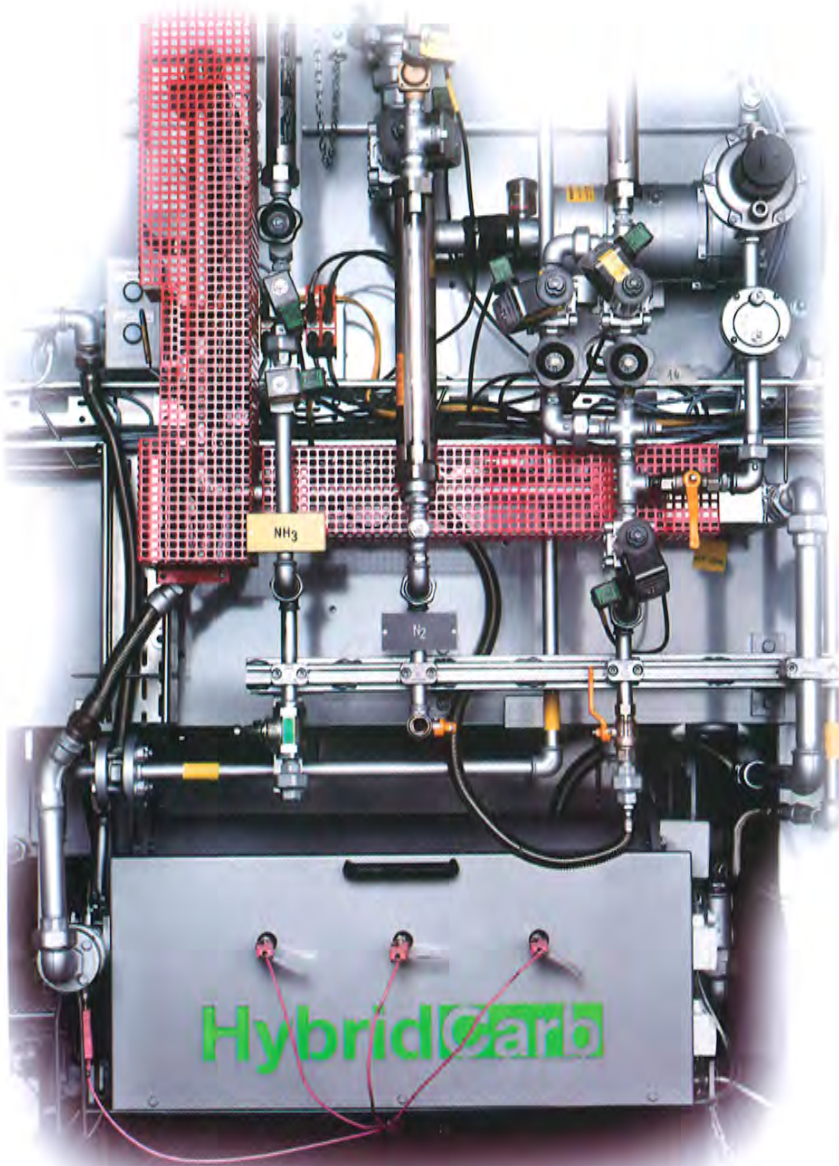
How is such an atmosphere furnace constructed and why in this way and not another? The following requirements were all important in the development of the design: First – uniform heat transfer to the charge and protection against direct heat radiation. Second – a uniform flow of the furnace atmosphere through the charge. Third – problem free operation and long furnace service life.

For the latter the most important factor is the characteristics of the furnace interior. The bricklining comprises insulating firebricks, which are suitable for temperatures well above the working temperature and are extremely durable. The arched roof is self-supporting and contains a built-in duct for the atmosphere circulator. The hearth is formed from a silicon-carbide plate – with especially large outlet openings for the gas recirculation, which ensures uniform penetration of the charge by the furnace atmosphere. The muffle which surrounds the hearth, and is likewise made from silicon-carbide, serves both to protect the charge from direct heat radiation and to promote a uniform temperature distribution in the material being hardened.

The Ipsen atmosphere furnaces are assembled from standard modules. Therefore they can easily be ideally matched to individual customer requirements.

How is an Ipsen atmosphere furnace heated? There are two alternatives available: gas or electric heating.

Integrated HybridCarb





Mixing battery and control electronics of a Recon®-heating system

a very long service life, not least because the heating elements do not come into contact with the process gases. In addition they do not cause any environmental pollution and do not cause any noise emissions.

For gas heating, the proven Ipsen Recon® burners with interior tubes made from special ceramic are used. They attain a particularly high thermal efficiency of up to 85% – not least thanks to a new type of recuperator burner, which uses the exhaust gas flow to recover waste heat. It is suitable for use with natural gas, a propane/butane mixture and LPG. It is distinguished by a low noise level and high temperature uniformity as well as a long service life, low maintenance and easy installation. Moreover the NO_x-values are considerably below the permitted values for TA air.

For electric heating, Ipsen standard cage elements made from metal radiant tubes are used. They provide the highest possible heat efficiency, a high power density and uniform heat radiation. They require very little maintenance and thus have

Excellent uniformity and reproducible results ensure high productivity



How the furnace charges are processed.

Various gassing processes are available for use in heat treatment of charges in Ipsen atmosphere furnaces. They are controlled using the Ipsen Carbon Sensor® and computer-based Carb-o-Prof® measurement and control system.

Carburisation, carbon nitriding, bright hardening and carbon-free bright annealing in multi-purpose chamber furnaces take place in carbon content-regulated atmospheres – for bright tempering in tempering furnaces, no controlled atmospheres are required.

The following gassing processes are particularly important in the above: Supercarb® air direct gassing, Endogas gassing and nitrogen-methanol gassing.

The proven Ipsen Supercarb® process is remarkable for its high efficiency and quick, uniform and reproducible carbon transfer. It works at heat treatment temperatures above 850 °C. In the process, the chamber furnace system is directly gassed using air and natural gas or another fuel, e.g. propane or alcohol (but not methanol). In comparison with other processes the Supercarb® process reduces gas consumption by up to 90%, considerably shortens the processing time and results in an exceedingly uniform carburisation layer.

Endogas is a gas mixture of 40% hydrogen, 20% carbon monoxide and 40% nitrogen as well as small fractions of carbon dioxide, water and methane. It can be used in very varied manners, e.g. with additional carbon dioxide for C-level controlled carburization, as a protective gas during bright annealing and tempering or with the addition of ammonia in nitro-carburization. In addition, endogas similar atmospheres with nitrogen-methanol gassing can also be used, but only at process temperatures above 800 °C.

Independent of which gassing type is used, hardening processes, carburisation and carbon nitriding cycles are controlled in a targeted manner by the process software Carb-o-Prof®.

The most common quenching method in a multichamber furnace takes place in an oil bath quenching-chamber. The quenching tank comprises a double-walled, insulated, steel plate housing.

Chain transport system of a multi-purpose chamber furnace



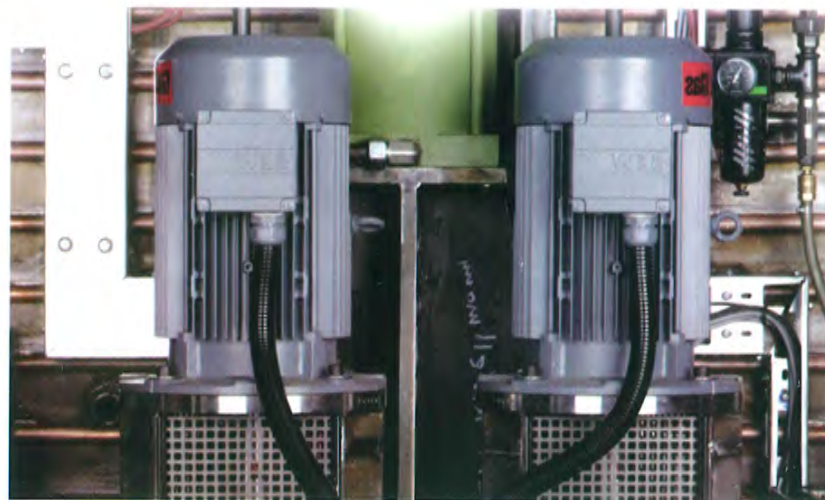


SuperQuench offers optimum quenching especially for low alloy steels.

Often, the quenching performance of a conventional oil bath is not sufficient, even with only slightly alloyed steels, to obtain the required properties. With the SuperQuench quenching chamber, Ipsen provides an oil bath for the heat treatment of widely varying steel grades, even slightly alloyed steels. To achieve this, the flow speed of the oil is much higher than that obtainable in conventional oil baths, due to the use of more powerful drive motors and larger circulators. Up to six motors per frequency converter can be continuously regulated – at up to four times the speed of conventional motors. In addition each individual circulator has been allocated a separate flow control system, so that the entire charge is reliably, uniformly and quickly cooled. Here also, the process software, Carb-o-Prof®, guarantees optimally adjusted control of the quenching process for all steel grades.

Here a chain conveyor system is used to lower an automatically fed in charge per hoist into the oil bath.

Symmetrically arranged circulators ensure that the hardening oil is strongly, turbulently mixed and fed via guidance channels through the charge. The process results in uniform hardening and minimal distortion. At the same time the speed of the oil circulation defines the type of quenching and with it the result of the heat treatment. It can be very flexibly controlled using the process software, Carb-o-Prof®.

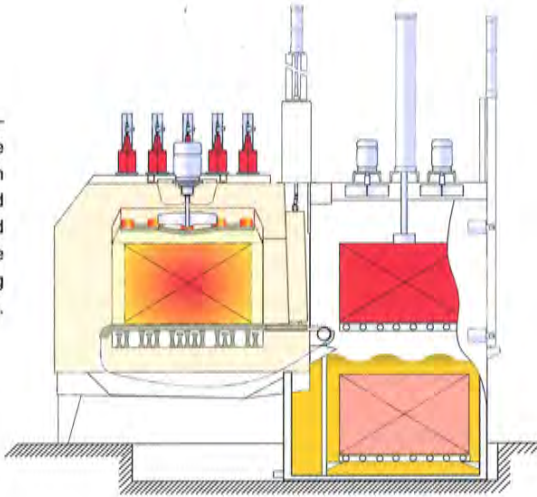


Drive motors of the two oil circulators

A quick look at our range.

Atmosphere technology from Ipsen is available in various standard sizes. Thanks to its modular design, it can be supplied in a wide range of technical types, matched exactly to customers' needs.

Type ATLAS RTQ – Gas-tight multi-purpose chamber furnace with an integrated double-walled oil quench bath. Based on retrieval principle (loading and unloading from the same side).



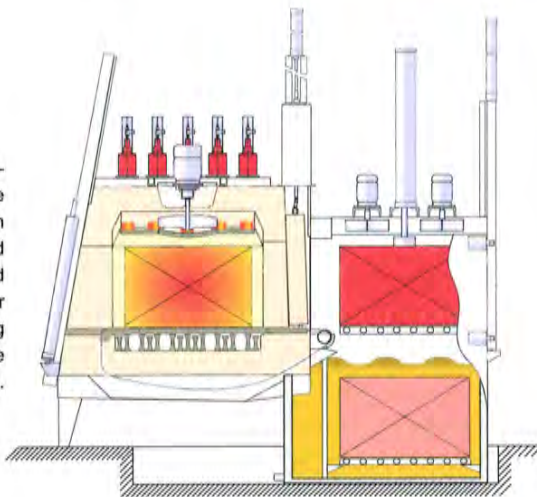
Atmosphere furnace technology from Ipsen is available in various standard sizes. Thanks to its modular design, it can be supplied in a wide range of technical types, matched exactly to customers' needs.

The following specific advantages are common to all furnaces: They offer full-surface charge support courtesy of the ceramic hearth and ensure, thanks to the ceramic gas conduction muffle and optimised circulation system, a particularly uniform atmosphere circulation and temperature distribution within the heating chamber. In all multi-purpose chamber furnaces, the charge is transported using the proven Ipsen cold chain system from the hot area into the quenching chamber.

Two alternative heating methods are available: gas or electrical.

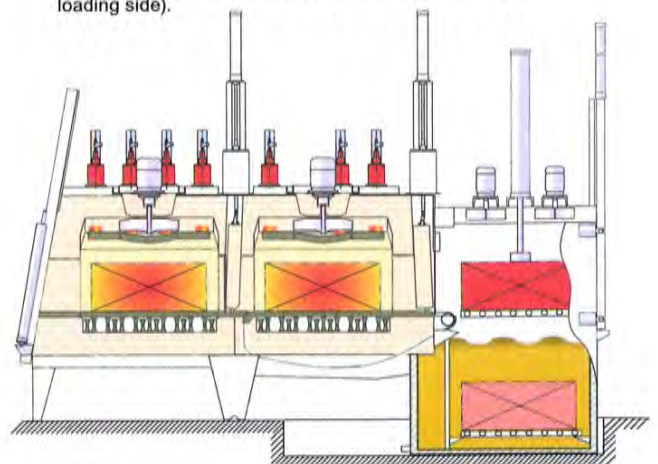
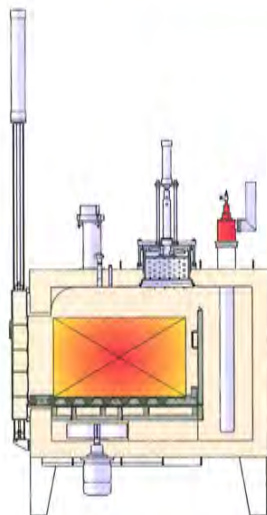
Alongside standard sizes, Ipsen offers custom manufacture of special types.

Type ATLAS TQ – Gas-tight multi-purpose chamber furnace with an integrated double-walled oil quench bath. Based on continuous transfer principle (unloading on the side opposite to the loading side).



Type ATLAS TQ-2 – Gas-tight multi-purpose chamber furnace with two heating chambers and integrated double-walled oil quench bath. Based on continuous transfer principle (unloading on the side opposite to the loading side).

Type DAC – Gas-tight tempering furnace with integrated lowerable heat exchanger for accelerated cooling.



Well advanced: The transport system.

Charging and discharging of atmosphere furnaces can be executed completely automatically. Not only that, the production software AutoMag® means Ipsen atmosphere furnaces can also be seamlessly inserted into the production line.

To permit integration of atmosphere furnaces into production and manufacturing processes Ipsen provides fully developed transport and storage systems – both automatic charging and discharging systems as well as intermediate storage systems and roller conveyors. The systems can be configured so that the charges can be accessed in any order or so that they are processed based on a “first in/first out” principle, in a saved sequence. To enable fully automatic control, automation and charging of the furnace systems and their peripherals, the proven AutoMag® production software is used. It offers a complete system overview, controls the automatic transport and permits data exchange with ERP systems such as SAP or Infor.



Ipsen transport systems ensure reliable production processes

It's all about your success: 360° Ipsen Customer Service.

We also provide comprehensive service and support every step of the way, including assistance with developing your process, factory layout planning and integration with current production processes and factory operating systems. We know that obtaining precise process and metallurgical results is essential. This is why we focus on process research and development – as well as on providing advanced customer support, training and process testing – to ensure you obtain the desired results.

You can also count on our responsive Ipsen Customer Service (ICS) Team to help keep your equipment running at peak performance and minimize costly downtime through upgrades, retrofits, parts, maintenance, service and training. No matter where you are in the world, any time you need support our ICS Team is available to advise you on your specific situation, as well as provide the necessary solutions.



Ipsen Customer Service

About Ipsen.

Since 1948, Ipsen has been designing and manufacturing industrial atmosphere and vacuum heat-treating systems and supervisory controls systems. This advanced equipment is designed for a variety of industries, including Aerospace, Automotive, Commercial Heat Treating, Energy, Medical and Tool and Die.

Much like our founder, Harold Ipsen, we believe that innovation drives excellence. We are committed to delivering integrated heat treatment solutions for a range of applications that enable you to improve titanium medical implants, develop more efficient cars and jet engines and transform space exploration. With nearly 70 years of thermal processing experience and thousands of systems installed worldwide, no company can provide 360° support for all of your heat-treating needs better than Ipsen.

Vacuum Heat Treatment

Ipsen delivers proven vacuum heat-treating technology that allows you to achieve maximum flexibility and meet strict industry demands. Whether your process can benefit from increased heating and cooling control, precise case depth and uniformity or flexible quenching options, Ipsen has the heat treatment solutions for you. Ipsen's vacuum furnaces also offer a wide range of sizes and versatility of processes, including annealing, brazing, hardening, low-pressure carburizing, solution nitriding, stress relieving and tempering.

Atmosphere Heat Treatment

With one of the largest installed bases of atmosphere heat-treating systems, Ipsen has the experience necessary to provide optimum equipment you can trust and rely on for full-scale solutions. Ipsen's ATLAS integral quench batch system continues this tradition, combining the achievements of past atmosphere furnaces with the evolutionary innovations of the future – incredibly advanced, energy-efficient controls, ease of integration and more.

Aftermarket Support

Count on our responsive Aftermarket Support Team to help keep your equipment running at peak performance and minimize costly downtime by meeting your needs for furnace controls upgrades, replacement hot zones, parts, maintenance and service.

With production locations in America, Europe and Asia, along with representation in 34 countries, choosing Ipsen means choosing a partner in success.



Sales & Service Represented by:

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