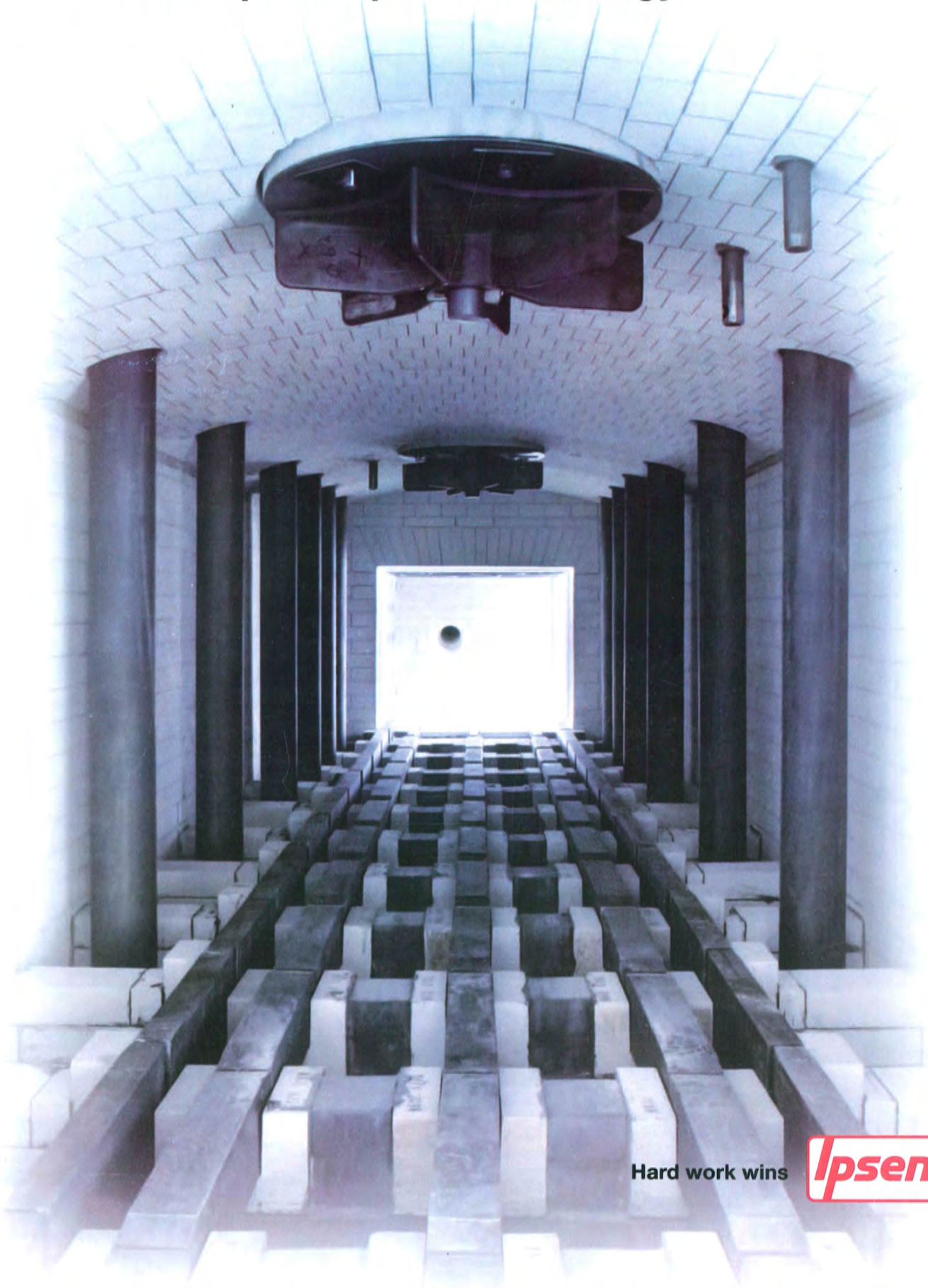




**What you should know
about Ipsen's plant technology.**

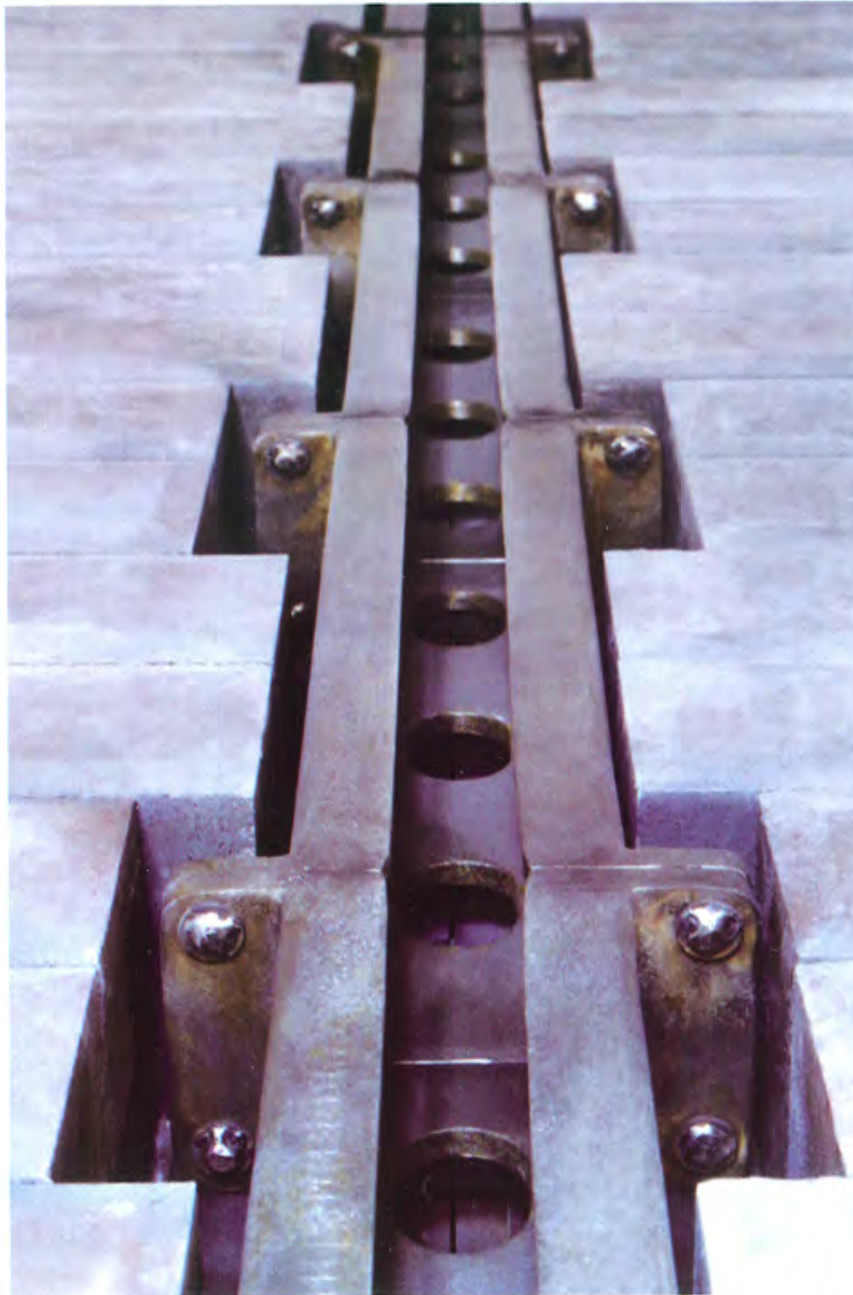


Hard work wins



Efficiency is the outcome: Pusher-type furnace systems.

Ipsen furnace plant stands out because of its low energy consumption, optimised thermodynamics, high efficiency and great flexibility. Which is especially true for Ipsen pusher-type furnace systems.

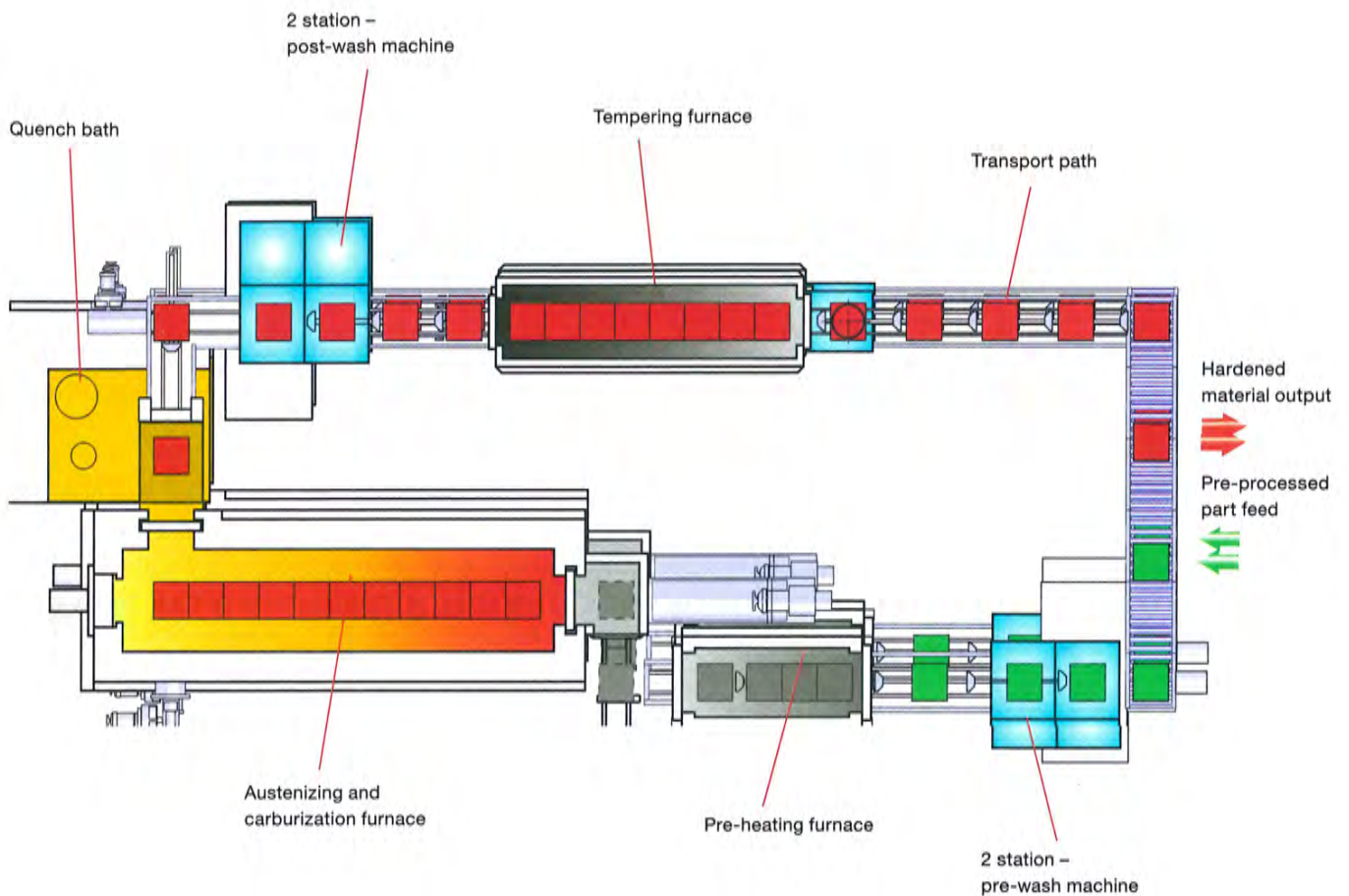


Routing
of the transverse
slottingchain in
a pusher-type furnace

Continuous furnaces, constructed according to the pusher principle, are suitable for the heat treatment of charge parts with or without protective atmospheres. High and low temperature furnaces, cleaning systems and quenching devices are linked together in complex units. As they have an extremely robust design, Ipsen pusher-type furnace systems stand out not only for their very high reliability, but also their ability to handle very large charge weights without problems.

Equipping with heavy-duty circulators not only guarantees homogeneous inert gas distribution within the heating chambers, but also generous circulation of the reactive gases around the workpiece. This and the optimised thermodynamics as well as innovative burner systems (Recon[®]-gas burners or electric radiant heating tubes) ensure optimum uniformity and reproducibility of the heat treatment results.

Pusher-type furnace systems are developed by Ipsen in close cooperation with the customer. In so doing, optimum solutions are searched for to the following questions: What are the space constraints on site? What requirements are made on the heat treatment process by the parts to be treated? What charges are expected? How flexible must the system be? And how should it be linked to the production lines which are already in place?



In recent times, the multiple-track furnace system has become more important, as it combines the requirement for a particularly high throughput with very flexible manufacturing. Doubtless also because it stands out for its compact and therefore space-saving design and because it permits to run different case hardening depths at the same time. Regardless, however, of whether a single or multiple track arrangement is under consideration - Ipsen's solutions offer a maximum in efficiency thanks to their specific construction. Which, first and foremost, means minimum distortion with optimum heat treatment results.



A circular affair: Rotary hearth furnace systems.

Ipsen rotary hearth furnace systems can be used for almost any purpose.

Thus they are suitable both for actual carburising / carbonitriding as well as solely for re-austenizing of already treated workpieces.



Rotary hearth furnace
with cooling system,
gas delivery valve and
hardening press

A further advantage of the rotary hearth furnace system is that it permits use of widely varying case hardening depths within a single installation. This is because with appropriate configuration of the process control, ContiControl®, different dwell times during the carburisation phase can be individually programmed.

Rotary hearth furnace systems are also developed by Ipsen in close cooperation with the customer, manufactured in Kleve, Germany and assembled on site.

Thanks to their high throughput, rotary hearth furnace systems, are preferred, just like pusher-type furnace systems, for processing large production-runs of identical parts. Rotary hearth furnaces are charged and discharged either automatically or manually – and can also be linked with other plant components.

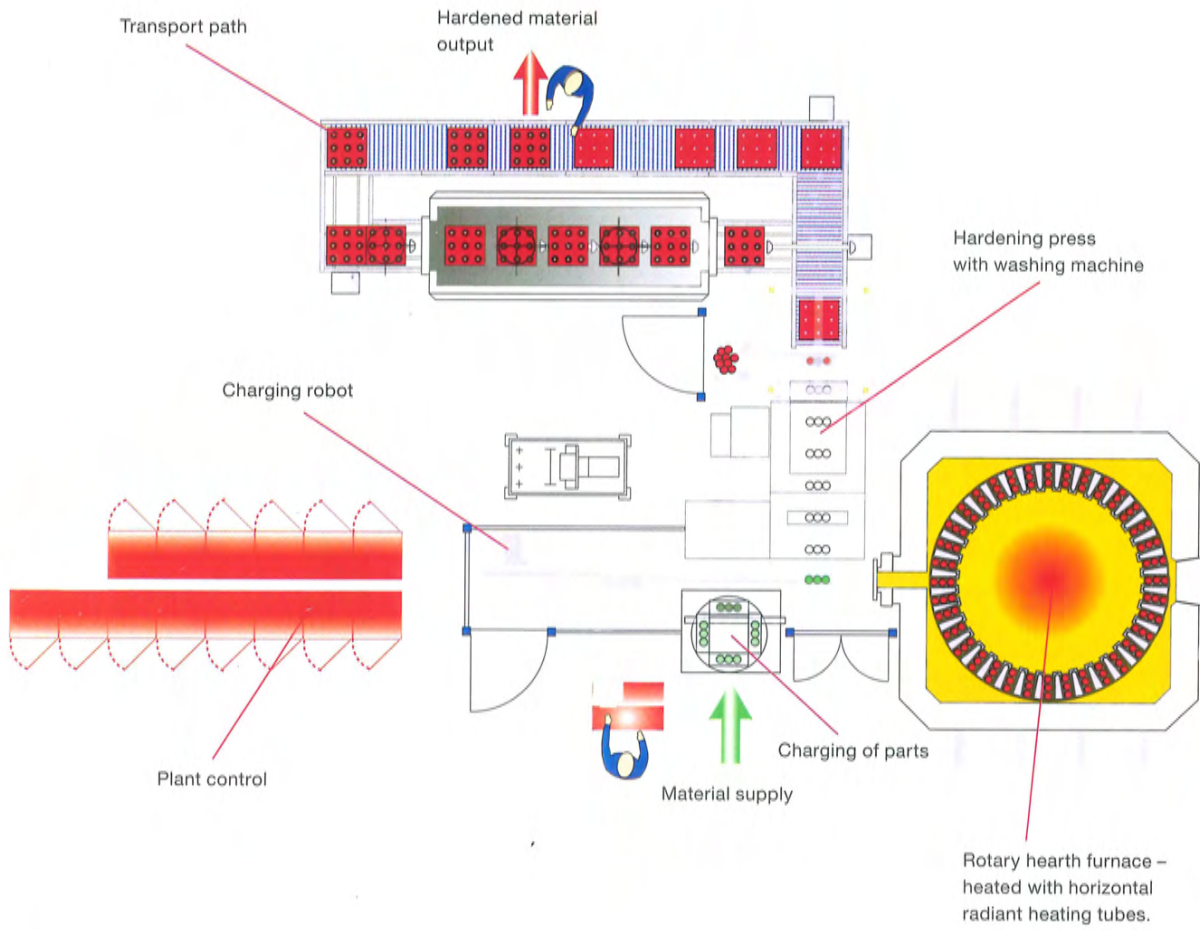
The rotary furnace type is ideally suited to single charging and discharging, but can also be used, without any adaptation for re-heating prior to press hardening. When equipped with additional inlet and outlet gates, the furnace can be inserted without problem in any heat treatment line.

Ipsen rotary hearth furnace systems are remarkable for their homogeneous temperature and gas distribution and can be offered in single-layer or multi-layer design.

The processes.

All common heat treatment processes, such as carburisation, nitriding and hardening or quench-hardening and tempering as well as tempering can be carried out with both pusher-type and rotary-hearth furnaces.

A particular speciality from Ipsen is the fuel/air direct gassing Supercarb®. In this process, the system is supplied directly with natural gas or another fuel gas, and air, without any protective gas generator. The process is very economical and stands out because of its quick, uniform and reproducible carbon transfer.



Individual part withdrawal through a slit door



The Ring of Fire:

Ring hearth furnace systems.

Ipsen's many years of experience in the field of continuous furnace systems formed the basis for development of the Ipsen ring hearth furnaces which combine the advantages of the extremely successful Ipsen pusher furnaces and rotary hearth furnaces.

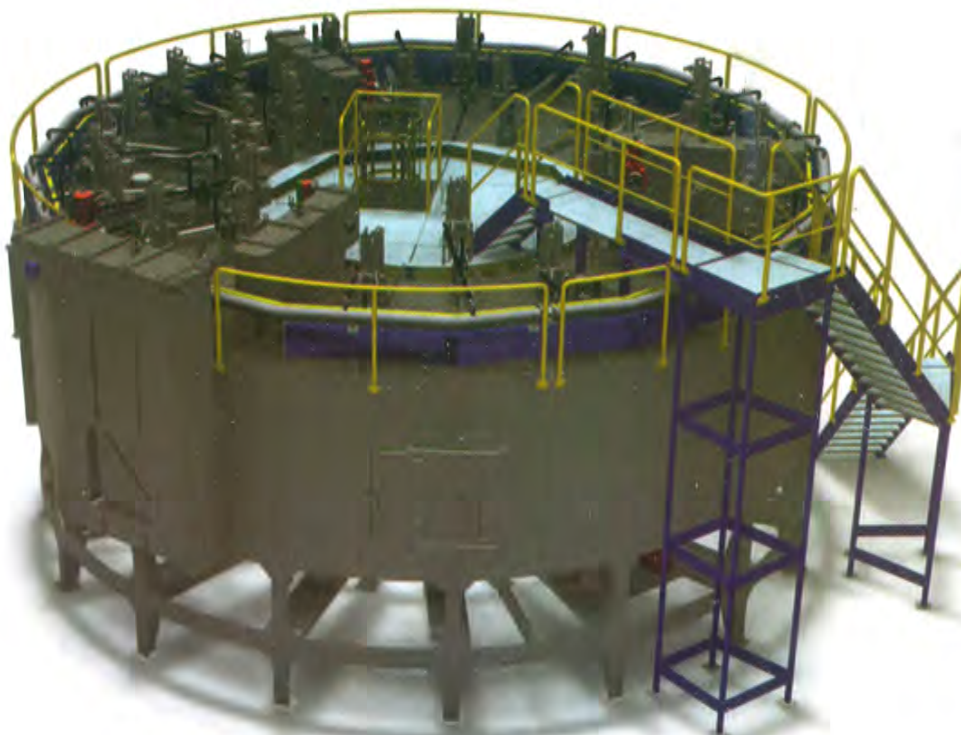
As is already the case on these two types of installation, the ring hearth furnace uses strong circulators for homogenous distribution of the protective gas. Recon® gas burners or electrical radiant heating tubes can be selected for heating.

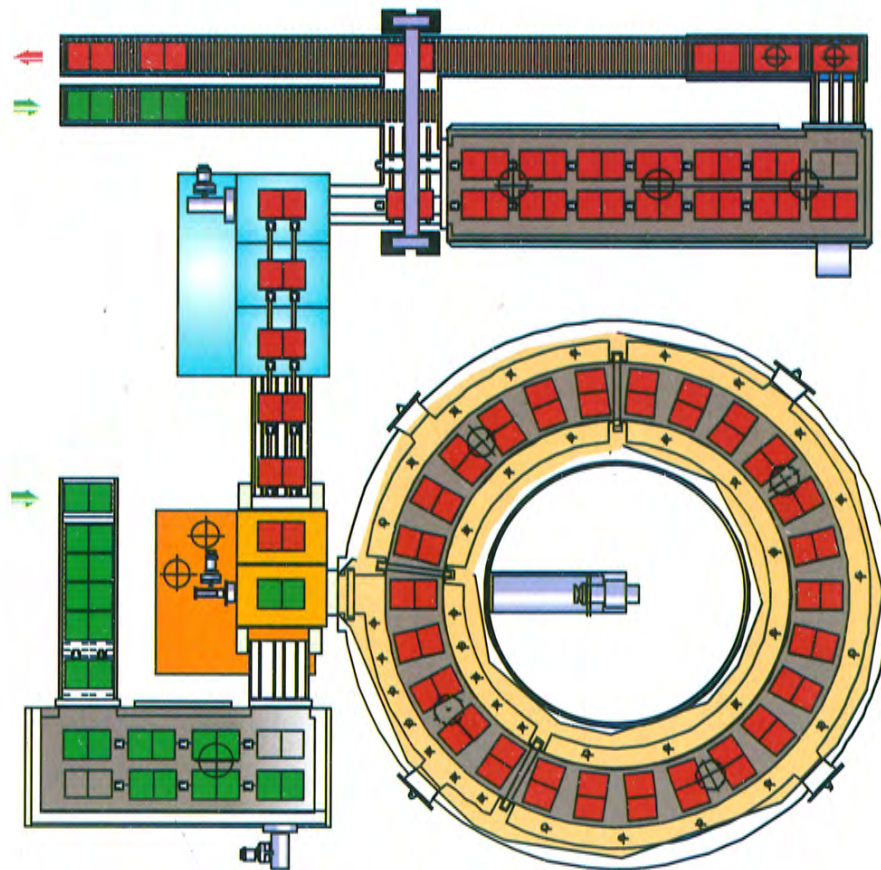
As on the Ipsen pusher furnaces, the furnace can be separated into individual zones with separating doors in order to implement more effective process control and to respond flexibly to varying heat-treatment requirements.

Like the Ipsen rotary hearth furnaces, the ring-hearth furnace features only one infeed and

discharge point, the advantage of which is low gas consumption. Only one drive unit is required to transport the charges in the furnace and this moves the entire ring hearth.

The rotating ring hearth with preshaped elements means that the charges do not need to be moved relative to the hearth floor and are not shifted as a block. This results in an extremely low mechanical loading of the charge carriers and the hearth floor, and it is possible to use lighter charge carriers.





Unlike the pusher furnace, no empty grids are required for emptying and any empty grid portal that would be required otherwise is not needed here. Depending on the particular application, the ring hearth furnace can be interlinked with a quenching oil bath (see layout) or a hardening press.

The new Ipsen ring hearth furnace thus offers a good alternative to the pusher furnace and combines its advantages with those of a rotary hearth furnace in targeted manner.

Like all other continuous Ipsen furnace systems, the ring hearth furnace systems are developed in cooperation with the customers in order to tailor the installation perfectly to their needs. The furnaces are manufactured and preassembled in Kleye, Germany, and are then erected on site and commissioned by our customer service staff.

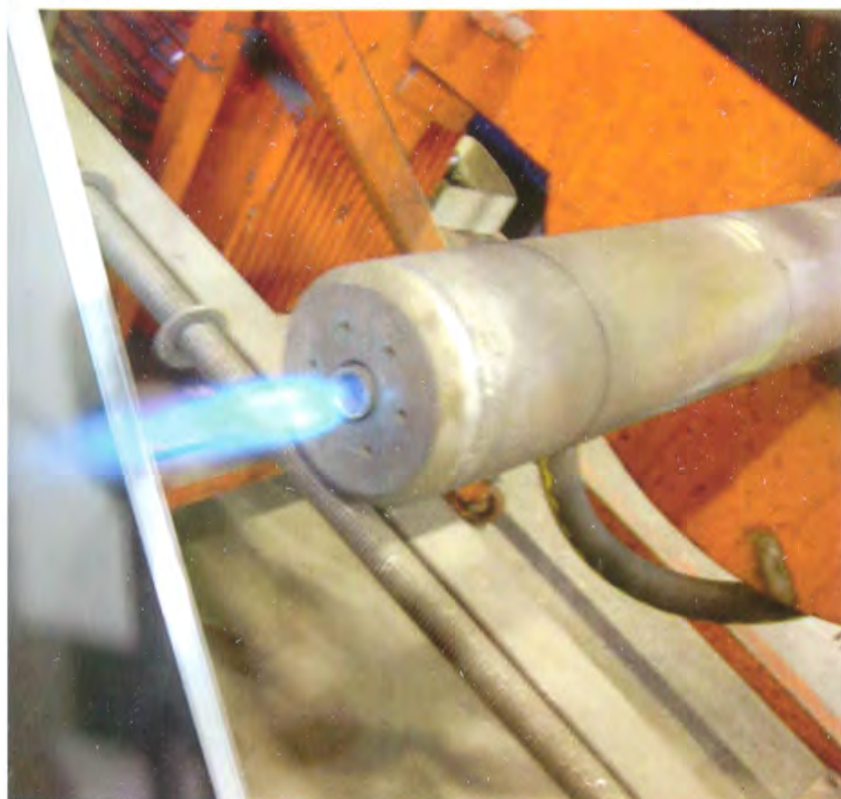
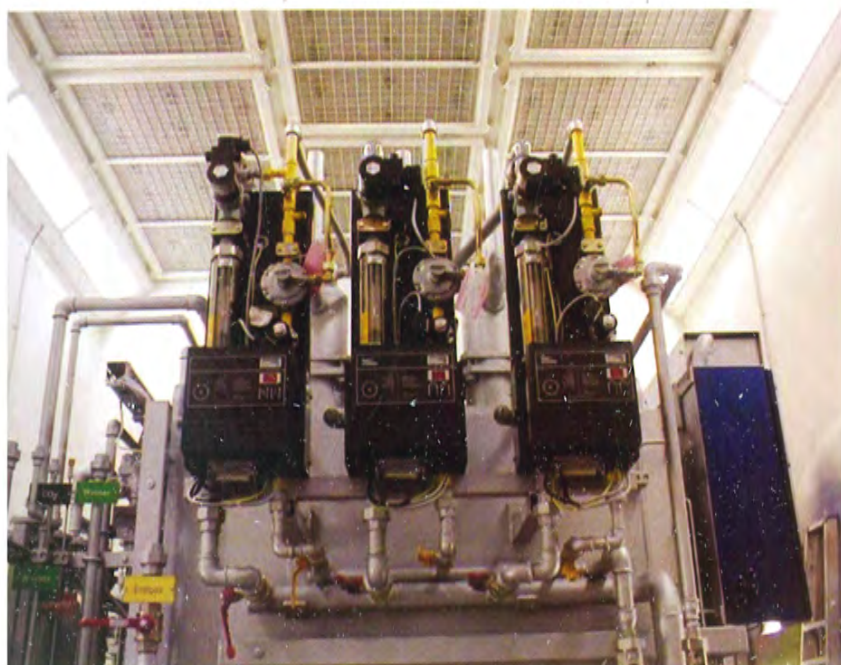
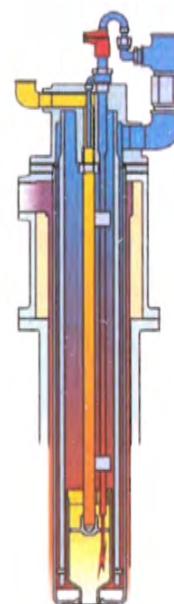


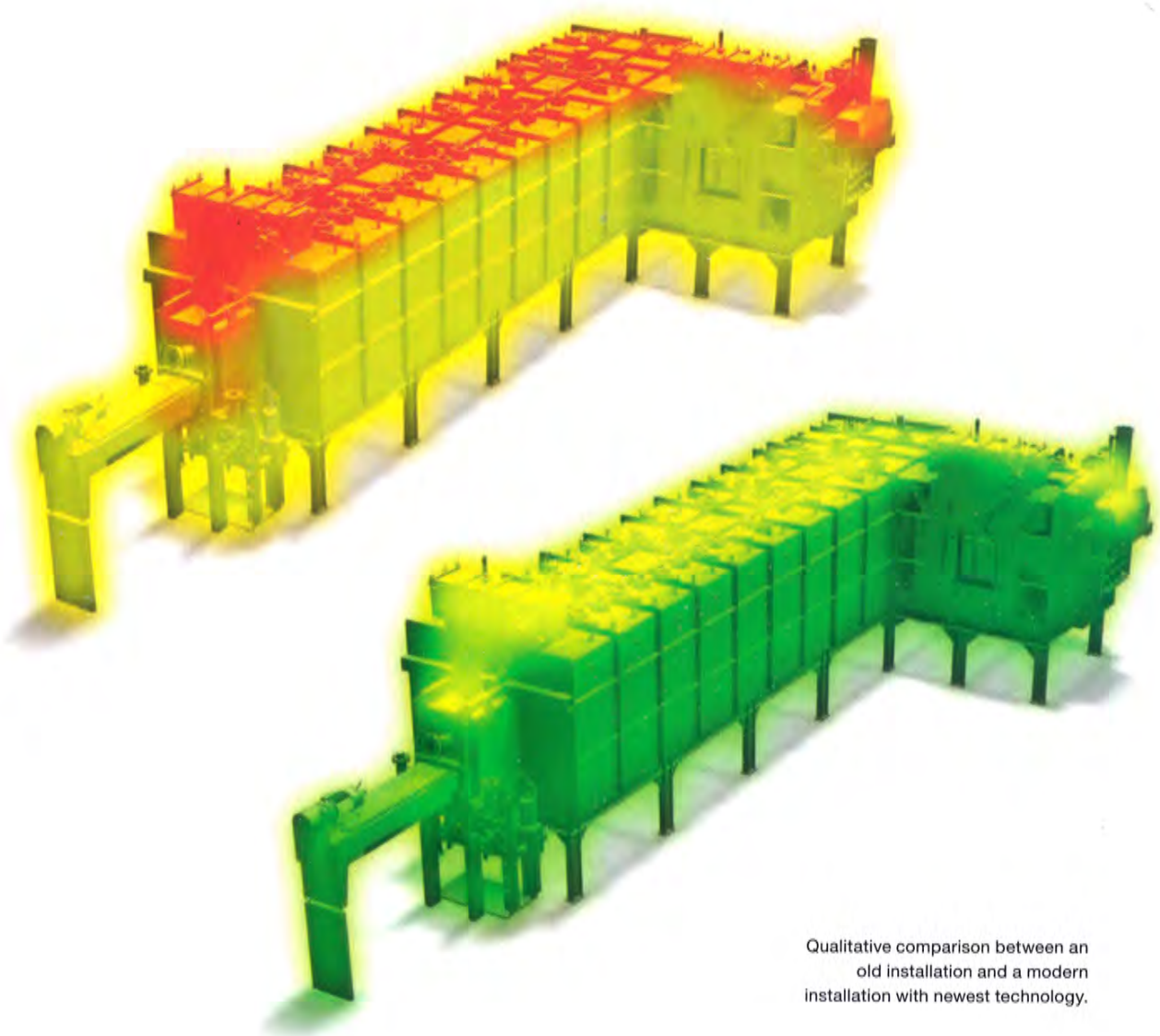
For the sake of the environment and your wallet – save energy.

There are many ways of saving money – one is to think about the environment. Here at Ipsen, coming up with energy-saving solutions for you has always been one of our main objectives.

More money in your wallet without making compromises and at the same time, doing something for the environment? This sounds good and is very simple – it's just a question of increasing energy efficiency.

And with us, energy efficiency starts right where the heat originates – in the burners. We offer Recon® burners, specially developed by Ipsen, for use in all types of installation. Besides being very sturdy and having a long service life, their specific feature is their high thermal efficiency. We achieve this efficiency thanks to high thermal recovery and combustion with low excess air.





Qualitative comparison between an old installation and a modern installation with newest technology.

Once the heat is in the furnace, we do not let it out easily again. We thus place our trust in gas-tight gates and lifting gates developed by Ipsen. In addition to lower heat exchange, they also offer the advantage of allowing very little air ingress. This not only guarantees a highly pure furnace atmosphere, but almost no energy is wasted at all. This is important not only at the gates. A great deal of heat escapes through the furnace walls in particular. We've come up with something here as well: by using special-purpose micro-porous insulating materials, we substantially reduce the outer wall temperatures and thus the heat loss.

A crucial amount of energy can be saved with the aid of energy-recovery systems. The choice of systems is a broad one. Combustion of carrier gas in the preoxidation furnace in particular affords advantages. We use gas from the high-temperature furnace which is normally burned off in a flare, thus being wasted, to heat the preoxidation furnace. But we also use other systems. For example, we utilize the waste heat of the oil bath to heat the washing unit or also for external use. However, these systems all have one thing in common: the installations are more energy-efficient and thus more economical.

Everything under control: ContiControl® – plant control software.

Plant control software should be able to do more than track charges and control their treatment. It should also help to ensure that energy and resources are used optimally to ensure optimum utilisation of the system. Like ContiControl®.



System visualisation
using ContiControl®

Continuous and semi-continuous Ipsen systems offer clear advantages: they help in handling large throughputs, save energy and ensure constant, highest possible levels of quality consistency. The Ipsen ContiControl® software solution was designed so that its benefits could be optimally used with all different system versions. In addition it offers highly flexible process and procedure control, optimisation of batch sizes and charge-specific logging.

This permits precise control and monitoring of all the heating and cooling zones of a system in a charge-specific manner – the charge tracking software continuously logs the data for all charges

held in the system and compares it with the pre-specified parameters. Process parameters are automatically converted by the system and – if necessary – where empty charges are required, appropriate empty charge times calculated. Adjustments are implemented immediately in the currently running process. The whole process is recorded in a charge-specific log and documented upon completion of the heat treatment.

In addition, special weekend and burn-out programmes increase production efficiency and with it system profitability. Concerning profitability: for cost control, ContiControl® captures the necessary data such as overall costs, costs per charge, maintenance costs and system availability and archives them. These data can be called up subsequently either individually or in combination for further analysis.

In short, Ipsen's software solution, ContiControl® not only contributes to meeting production targets, such as production quality, quality consistency, reproducibility and reliability, it also ensures they are continuously optimised.

Well advanced: The transport system.

Charging and discharging of continuously-operated pusher-type furnace systems is carried out completely automatically. ContiControl® production software permits tracking of individual charges at all times within an Ipsen pusher-type furnace system.

To integrate pusher-type furnace systems in production 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 ContiControl® 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



The Service. All included.

The optimum solution is one-stop supply: alongside its furnaces and systems, Ipsen offers optimum service, 365 days a year, 24 hours a day.

To conclude then, a few words about Ipsen's service. Hardly any other engineering product lasts as long as an Ipsen system. This is because of the quality of our furnaces. Nevertheless they need professional servicing. And to achieve this we provide you and our furnaces with the best possible customer service.

Nevertheless should a repair be required: You can reach our service hotline +49-1 72-2 53 39 10 365 days per year, 24 hours a day, so that our service technicians and engineers can help as quickly as possible. And we have got even more in stock: the largest spare parts range in the world for Ipsen plant technology.



Always at hand:
A selection of important wear parts is always carried by our service vehicles.

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.



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