

Powder People

New ideas and new challenges are the inspiration for growth, both in individuals and organizations. We have always taken this tenet seriously, so we are happy to formally announce a few changes and additions in our ranks.

Mr. Koki Kanno joined the sales team at Höganäs Japan KK in April this year. A graduate in metal materials studies at Tohoku University, he comes to us from Fuji Heavy Industries Ltd., where he has served as Engineering Manager of their Powder Unit Research Division 2. Welcome!



Mr. Staffan Laurell, having started his training already, will move full-time to the Gas Atomized Powder division as of January 1, 1998, as world-wide Sales Manager for Gas Atomized Powders. He will be based in

Höganäs, but his assignment will carry him regularly to customers around the world.

Mr. Mats Persson is another Höganäs stalwart. He was previously the marketing liaison with Coldstream and, most recently, has been involved with special materials in magnetic applications. This last posting proved particularly fruitful, for Mats has now taken over Staffan's role as marketing coordinator for Soft Magnetic Composites – a material and technology for which we see a great future.



Nor is **Mr. Christophe Szabo** a stranger to us. Trained in Mechanical Engineering at the University of Karlsruhe, he did thesis work at Höganäs R&D in the field of metal fatigue. A French national, he

now joins the sales staff of Höganäs GmbH in Düsseldorf.

A warm welcome and congratulations to each of these gentlemen.



A universal THANK YOU

We were overwhelmed by the range and quantity of gifts and congratulations which Höganäs AB received from customers, suppliers and working colleagues around the world, to mark our Bicentennial.

These provide a permanent memento of a fruitful ongoing dialogue and collaboration towards the enhanced use of metal powders between the many members of the world's metal powder community.

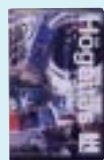
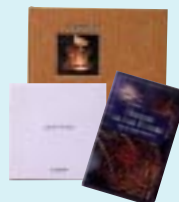
We will cherish each item as a reminder of these aims. Thank you very much!



New information sources

A range of new Höganäs marketing material was produced simultaneous with the Bicentennial.

Höganäs' exciting first two centuries of operation, and its goals for the future, are presented in the Anniversary video and in the Anniversary book.

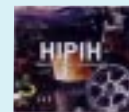


You can also meet today's Höganäs in the new Company presentation and Sales Video which contains some intriguing customer statements regarding future iron powder applications.

Höganäs powders for the Chemical and Metallurgical market are presented in a new sales brochure. A product data brochure is now also available for Somaloy 500, the latest SMC powder.



Höganäs HIPIH on CD-ROM is an invaluable interactive tool for anyone working with sintered components.



The literature and CD-ROM can be obtained through your Höganäs contact. Note: some items, such as the Anniversary book and video, are only available in a limited edition.

Höganäs

The Difference is Knowledge

HÖGANÄS POWDER NEWS

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A welcome future



Readers will note that this is an extended issue of Powder News. The reason is, of course, the Bicentennial celebration. We've tried to capture its highlights here – to inform those of you who couldn't join us, and as a memento for those of you who did. The sea cruise, food, exhibitions, tours and entertainment were a great pleasure in the balmy weather, but the real highlights of the two-day event were the lectures given by leading automotive industry experts. More about that on the pages that follow.

The Bicentennial naturally involved a retrospective look at Höganäs' history, and the traditions that have kept us healthy for 200 years. But perhaps most important, it highlighted the best tradition that any company can have in a rapidly changing world: a stubborn insistence that the future holds unlimited potential which, through careful investigation, collaboration and intelligent teamwork, can bring great benefit to us all.

Enjoy your reading!

■ ■

Yours Sincerely,

Claes Lindqvist

THE DIFFERENCE
IS KNOWLEDGE

Höganäs 

For Höganäs, this has been an eventful year – particularly the early summer.

In the first week of June, hundreds of our customers, suppliers, investors and development colleagues joined us to celebrate our 200th Jubilee – an event which lasted for a full week.

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Taking the water route to a movable feast

What better means to create both transportation and accommodation for 300 visitors from around the world than to put them on a floating, moving palace!

THREE SEA TOWNS

Our Bicentennial celebrations encompassed both the major exhibitions and presentations at Höganäs and a tour of the atomizing plant, 60 kilometers up the Swedish West coast at Halmstad. Only the Öresund – the 'throat' of the Baltic Sea – separates these two sea towns from Copenhagen, where most of our visitors were to make their arriving and departing connections for the Bicentennial.



M.S. NORDNORGE

Early in the planning it became clear that, to successfully coordinate so many visitors, we would need to apply a holistic perspective. And so we took the opportunity to make the most of the body of water joining all three locations. We would utilize an ocean-going ship!

As her passengers during the 3-day celebration will attest, the M.S. Nordnorge – which normally carries tourists from Bergen to Kirkenes, above the Arctic Circle – served ably as a convenient transport from Copenhagen to Höganäs and Halmstad, and a charming – if unusual – accommodation during their stay.



BICENTENNIAL DINNER

She was also the venue for the grand finale celebration and dinner.

After visiting the atomizing plant, more than 300 customers, suppliers and Höganäs personnel (as well as the spouses of many attendees) returned to the ship at Halmstad harbor.

As M.S. Nordnorge cruised slowly across the Bay of Laholm, guests assembled on the sun deck for refreshments were treated to an air show with true historical span. First, an aerial artist flying a vintage single-seater bi-plane performed a series of loops, rolls and other feats of aeronautic derring-do. Soon thereafter – and at considerably higher speed



– came a Swedish Air Force fighter jet. It was quite a sight to watch close-hand as this formidable craft shot vertically from just above the wave tops to 5,000 meters height!

At the banquet which followed, guests were tempted by Scandinavian gourmet delicacies. Dinner was capped with speeches by the chairmen of the Japanese, American and European Metal Powder Associations, and the entertainment and dancing which followed continued until well past midnight.

And, as our visitors awoke the following morning, they found their floating palace once again alongside the quay in Copenhagen.



Ladies' programme



The Jubilee offered a multi-faceted programme, entertaining both visiting executives and their spouses. On the second day of the celebration, no fewer than 130 ladies were treated to a tour of Northwest Skåne's scenic attractions.

A JOURNEY THROUGH HISTORY

The show started with a visit to the Höganäs Salt-Glazed Ceramic Works, the last remaining working vestige of the company's early history, where a range of stoneware is still produced.

Boarding the four tour buses provided for their transport, the group proceeded to Sofiero Castle, once the summer home of Sweden's monarchs and now a horticultural jewel open for the public's pleasure. Here, they were given a guided tour of the castle and its extensive gardens, followed by a smorgasbord lunch, augmented by traditional Swedish midsummer entertainment in the form of folk singing and dancing.

After lunch, sightseeing continued, with a running narrative of local history and culture. A stop was made at Mölle, at the edge of the delightful Kullaberg Nature Reserve, where guests partook of afternoon coffee and cakes at the Grand Hotel.

The mild summer weather made the onward journey up the Swedish coastline a smooth and pleasant one. Punctually at 5.30 p.m., the group rendezvoused with their spouses at the M.S. Nordnorge's boarding ramp in Halmstad harbor.

We do hope we left our lady visitors with some fond memories of Höganäs and Northwest Skåne. Welcome back!



The whole picture

The exhibitions at the Bicentennial celebration (and throughout the summer, for the benefit of visitors to the area) gave a rich perspective on the company's long history, whilst accurately and graphically reflecting both current- and potential future uses for metal powder.

No fewer than 63 companies and organizations contributed both effort and products, in order to make the exhibitions interesting and illustrative. Recognition should be given where it is due, so we take this opportunity to extend a heartfelt thanks to everyone who helped make this a truly entertaining and memorable exhibition.

In alphabetical order, they were:

ACL Bearing Company,	<i>Australia</i>
Adcomat Sdn Bhd,	<i>Malaysia</i>
Akzo Nobel Chemicals B.V.,	<i>Netherlands</i>
Ames,	<i>Spain</i>
Auotofield Engineers Pte. Ltd.,	<i>India</i>
BMW,	<i>Germany</i>
BTMT,	<i>Germany</i>
Chin Chih,	<i>Taiwan</i>
Chpo Deloro,	<i>France</i>
Daedong Brake,	<i>Korea</i>
Dalforsan AB,	<i>Sweden</i>
Duroc AB,	<i>Sweden</i>
Eaton Automotive S.p.A.,	<i>Italy</i>
EGA Sinter,	<i>England</i>
Ferritslev,	<i>Denmark</i>
Ford,	<i>Germany</i>
GKN Bound Brook,	<i>England</i>
GKN Bound Brook,	<i>Italy</i>
Hitachi PM,	<i>Japan</i>
Holmegaards Glasvaerk A/S,	<i>Denmark</i>
KPM,	<i>Korea</i>
Krebsøge,	<i>Germany</i>
Laboritaires Vibrac,	<i>France</i>
Merisinter,	<i>Italy</i>
Miba,	<i>Austria</i>
MiniGears,	<i>Italy</i>
Mitsubishi,	<i>Japan</i>
Monroe,	<i>Australia</i>
NFG,	<i>Japan</i>
Nichols,	<i>Germany</i>
Ningbo,	<i>China</i>
Oerlikon Sverige AB,	<i>Sweden</i>
Opel,	<i>Germany</i>
Peugeot-Citroën,	<i>France</i>
Porite,	<i>Japan</i>
Porite,	<i>Taiwan</i>
Powdermet,	<i>South Africa</i>
Powdertech Co. Ltd.,	<i>Japan</i>
Presta,	<i>Liechtenstein</i>
Rigby,	<i>England</i>
Rijnstaal Group B.V.,	<i>Netherlands</i>
Samdo,	<i>Korea</i>
Samhan,	<i>Korea</i>
Shorlube,	<i>Australia</i>
SHW,	<i>Germany</i>
Sigma Elektroteknisk A/S,	<i>Norway</i>
Sintermetal,	<i>Spain</i>
Sinterstahl,	<i>Germany</i>
Sintertech,	<i>France</i>
Sinterwerke Grenchen,	<i>Switzerland</i>
Smart Motor A/S,	<i>Norway</i>
SMC, South	<i>Africa</i>
Sturmer Archer,	<i>England</i>
Sumitomo,	<i>Japan</i>
Sundram Fasteners,	<i>India</i>
Thale,	<i>Germany</i>
Tokyo Sintered Metals,	<i>Japan</i>
Toyota Motor,	<i>Japan</i>
University of Newcastle upon Tyne,	<i>U.K.</i>
Valeo Engine Cooling AB,	<i>Sweden</i>
Volkswagen,	<i>Germany</i>
Weartec,	<i>Denmark</i>
Österby Gjueteri,	<i>Sweden</i>

Mapping the way ahead

For visiting customers and suppliers, the high points of the Bicentennial were the presentations at Höganäs exploring the future of metal powder and, more importantly, the industries to which it contributes. Plant visits in conjunction with the presentations gave our visitors an idea of Höganäs' preparedness to meet the future's challenges.

For the presentations, the stage was set by Claes Lindqvist's welcoming speech and an entertaining cinematic synopsis of Höganäs – historical, and as we perceive our future.

WHERE ARE WE DRIVING TO?

Next came the keynote address, given by Malcolm Harbour, Managing Partner of Harbour Wade Brown and a respected authority in the automotive industry.

His incisive presentation, entitled *The Automobile Industry into the next Millennium*, managed to look not only at the type of transportation we will build, but also how and why we will build it, how we will collaborate to keep the industry profitable and, most important, how the consumer's changing attitude towards transportation will affect the industry's future.

SOME IMPORTANT POINTS:

- Car demand is forecast to reach 90 million by 2015 (from 52 million in 1995).
- While markets in industrialized countries offer opportunities, it is in the developing countries that real growth will come in the next twenty years.
- As necessary infrastructures develop, global sourcing and global production become increasingly important. Expertise and, of course, profitability will determine assembly location (or locations).
- More intimate cooperation and integration between makers will inevitably come as a result of globalization, required economies of scale and increasingly focused niche market demand.
- The profile of the consumer will be affected by such issues as:
 - environmental considerations and legislated environmental restraints
 - car use vs. car ownership, and activity-specific car use
 - splintered age, sex and employment demographics
 - the concept of personal mobility, as opposed to private vehicle ownership
- The vehicle design and technology which will try to answer these disparate and sometimes conflicting needs will have a profound effect on the very definition of the word automobile – the materials it is made of as well as its propulsion mechanisms. This, in turn, will affect the goals and priorities of the entire auto production industry.



The presentation gave everyone food for thought and discussion as they proceeded to tour the Sponge Iron-, Powder- and Distaloy plant facilities at Höganäs.

AND HOW WILL WE GET THERE?

The following morning, five more speakers put some concrete details into the Höganäs vision of the future, giving indicators of the development of technology, the role metal powders will play in it, and the way we will fulfil our commitments to customers.

THE PRESENTATIONS WERE:

Driving into the 21st Century

William Jandeska, Ph.D.

Manager, Powder Metallurgy Technology, General Motors Powertrain Group

In a brief but succinct presentation, Mr. Jandeska 'threw down the gauntlet' for everyone working with P/M in the automotive industry. Highlighting facets of powertrain technology evolution – such as higher power densities, lighter packages and material- and drive-system hybrids – he showed how P/M can help deliver value to the consumer, and thereby help sustain the industry.

Electrical Machines and the Concept of SMC

Alan Jack, Research Fellow at the University of Newcastle upon Tyne

Mr. Jack clearly illustrated the design, devel-

opment and profit potentials of electrical machine construction using Soft Magnetic Composite technology. His presentation is treated further in our new newsletter, SMC Update.

Future Potential of Products based on Metal Powders

Jan Tengzelius,

R&D Manager, Höganäs AB

Mr. Tengzelius surveyed the expanding range of possible metal powder applications, focusing on the particular

growth potential of automotive P/M technology and Soft Magnetic Composites. Outlining the hurdles which must be confronted, he underscored the importance of closer collaboration with powder end users, and pointed to the extensive creative resources at hand in the world's metal powder community.

R&D cooperation between Hoeganaes Corporation and Höganäs AB

K (Sim) Narasimhan,

V.P., Technology, Hoeganaes Corporation

Mr. Narasimhan's brief presentation expanded on the joint development programs which the two companies share – in high-performance materials, surface engineering and electromagnetic products – showing how the collaboration has enhanced the adoption of P/M technologies in the world's manufacturing community.

Investments for Growth

Sten-Åke Kvist,

Senior V.P., Höganäs AB

See article opposite.

The day's presentations were followed by lunch on board M.S. Nordnorge as she cruised northward towards Halmstad, where participants were given a full tour of the atomizing plant.

■ ■

The start of the presentations was made doubly memorable by the ceremonial opening of a sake barrel – a gift from the members of the Japan Powder Metallurgical Association



Investments for growth

by Sten-Åke Kvist

Continuous improvement is the norm at Höganäs production facilities around the world. This presentation, however, focuses on Sweden – in connection with the Bicentennial celebration.

Metal powder use continues to increase. It is important that Höganäs stimulates this trend by living up to its delivery commitments, even when the business cycle is at its peak. Since 1986, investments have averaged 20 million US dollars per year, in expansion of production as well as quality and productivity.

A BRIGHT FUTURE

Technologies such as Warm Compaction and Soft Magnetic Composites will further stimulate growth. That's why our investments have further intensified in the past five years. The goals are five-fold:

- Capacity increase, to answer projected demand
- Productivity- and flexibility improvements, for enhanced competitiveness and quicker response to market needs
- Tighter powder tolerance criteria, to help customers minimize variation in their own production
- Energy conservation and environmental improvement, to surpass regulatory standards
- Lowest Total Cost for the customer, to fulfill our promise to you.

ALL ASPECTS OF SWEDISH PRODUCTION

Investments cover powder production, processing and enhancement. A closer look at each of the production facilities here in Sweden follows.

- The Atomizing Plant in Halmstad – which utilizes high-grade steel scrap as its primary raw material – was built to han-

dle capacities up to 300,000 tons. Market demands have not yet forced us to test this limit, but productivity- and efficiency investments make it possible to quickly increase output.

Environmental investments are also bringing rewards, with reduced energy needs and lower emissions, and overflow process heat augmenting the local municipal heating network. The newly commissioned pelletizing plant lets us extract zinc oxide from the dust generated by the melting process, recycling it to zinc producers – another step towards environmental sustainability.

- At the Sponge Iron Plant in Höganäs, streamlined production layouts, energy- and labor-efficient machinery and a new computerized control system are helping to boost productivity and quality. Fine-tuning will lead to further improvements and output growth in the coming years.

Significant steps, in terms of energy consumption and emissions, have brought the Sponge Iron Plant in line with our declared environmental policy.

- The Powder Plant in Höganäs has undergone significant changes. Raw powders from the Sponge Iron and Atomizing Plants are further refined here, to produce more than 50 different powder grades. We aim to answer market growth with optimal powder consistency, higher productivity and lower emissions.

Our 25 MUSD investment program here includes a separate production area for base powder grades, which augments efficiency and quality. The new high-output annealing furnace inaugurated there in June, and another which

comes on-line mid-'98, will ultimately double the production volume. The restructuring also gives greater flexibility and tighter control in the production of small-scale powder grades.

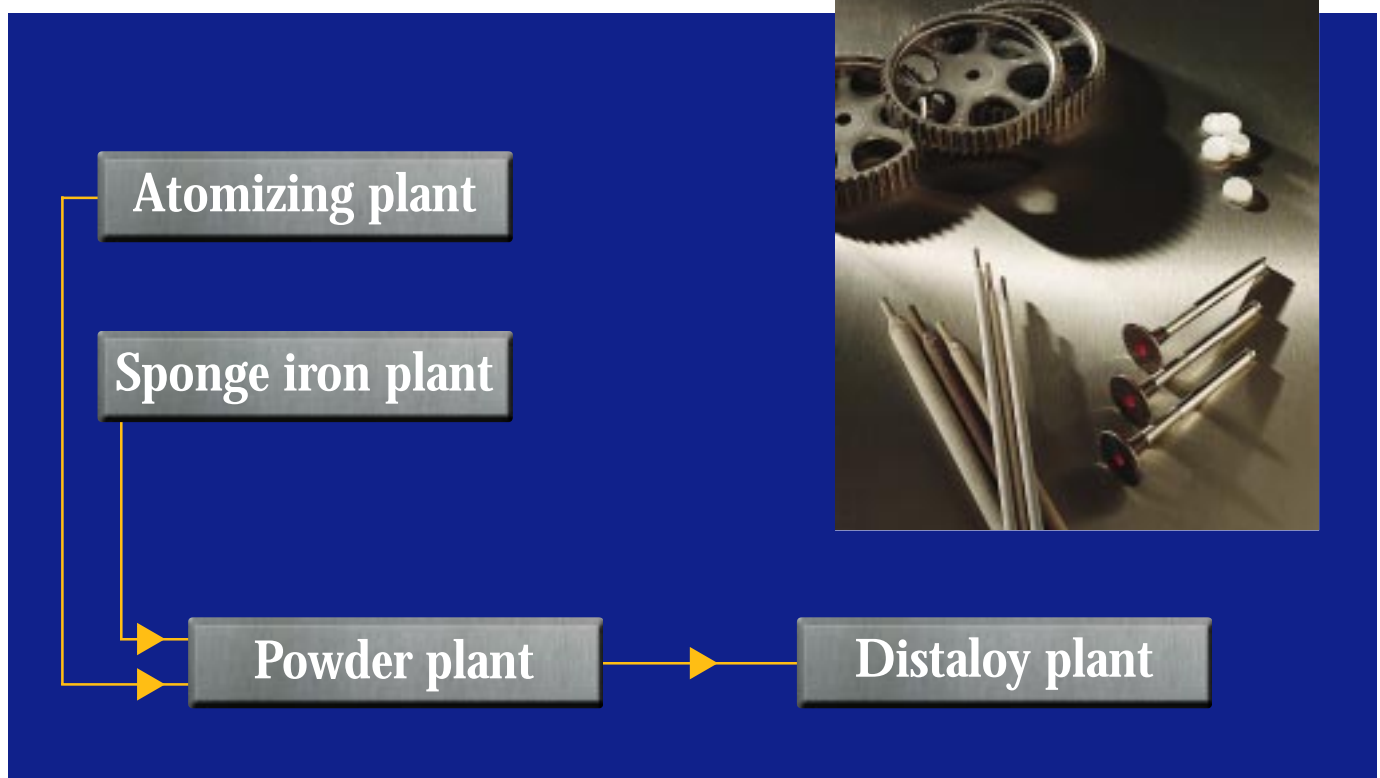
- The Distaloy Plant in Höganäs, which came on line in 1991, is where much of the Powder Plant's production is further enhanced by alloying, mixing or bonding with elements such as nickel, copper, molybdenum and lubricants. In total, some 600 different powder grades are produced here.

Today, this plant is a benchmark operation in terms of quality, productivity and environmental safety. Ongoing investments include further refinement of quality strategies, production lines for DENSMIX and Soft Magnetic Composite powders, and process improvements which increase flexibility, permitting a greater range of alloying and bonding elements. These investments will stimulate development of new iron powder uses at the same time they ensure added value and quality in existing applications.

A BINDING COMMITMENT

The Höganäs business idea – the Lowest Total Cost for the customer – is realized through ongoing investment in product development and quality. We are committed to stimulating metal powder use in a wide range of applications.

The future is bright. We aim to be a strong part of it, with a product and capacity that fully answers tomorrow's needs.



Hot interest in new P/M technology

We were glad to be able to put on a real working demonstration of the Warm Compaction technique during our Bicentennial celebrations.

Guests were able to follow the process, from powder to finished component, at the pilot-scale production unit set up at the Höganäs Central Laboratory. Personnel from both Höganäs and its development partners were on hand to explain and discuss the process.

Each visitor was able to take home a synchronizing hub, single-pressed from Höganäs DENSMIX powder. The demonstration pieces were net shape, requiring only a standard sintering to become a finished component with a density of 7.25 gm/cc.

CLOSE COLLABORATION

The demonstration was made possible by tight teamwork with three of our development partners. Complementing Höganäs

know-how in powder and technology, they were:

- Linde Metalteknik AB – developer and producer of the Linde slot heating system, which ensures exact heating of the powder mix.
- Dorst Maschinen und Anlagenbau GmbH – producer of the special heated filler system and press utilized for Warm Compaction.
- Alvier AG – tool and die experts, who have developed the tooling used for Warm Compaction.



Interest was strong at the Warm Compaction demonstration. A steady stream of questions and comments kept personnel busy

Warm compaction by Höganäs

Höganäs 

See you in cyberspace!

Höganäs AB has come to the Internet.

This dynamic medium, with a subscriber base that grows at a rate of 25% every 3 months, is becoming a natural 'meeting place' and a secure avenue for quick and easy communication with one's peers.

By the year 2000, it is projected that there will be more than 500 million computers connected to 'the Net'. The technology is here to stay, and is already having a dramatic effect on the way we do business.

Today, the Internet has 3 primary functions: as a conduit for the distribution of electronic mail (e-mail), as a forum for written group discussions, and as a medium for the dissemination of information and advertising via the World Wide Web.

OPPORTUNITIES ABOUND

Mass marketers derive the most obvious benefits from the Internet, but even companies like Höganäs AB, whose market is much more focused, can enhance marketing activities. For example:

- We can reach prospects outside the defined customer target group. Many products have as-yet undeveloped alternative uses. And we can sell in markets that are hard to reach.
- We can give added value to existing customers – in the form of up-to-the-minute information
- Through better service and support. Many simpler problems and questions can be resolved immediately by giving the customer direct access to 'expert' systems, or even in the form of a distilled list of 'FAQs' – Frequently Asked Questions.

[HTTP://WWW.HOGANAS.COM](http://www.hoganas.com)

Via the Internet, customers around the world can now quickly and easily access current information about Höganäs AB.

Our web site presents our company and products. It also offers the visitor a simple way to quickly contact the organization, or to order printed brochures and information. But we'd much prefer you visit it yourself. Welcome!



E-MAIL US

All personnel at Höganäs are now linked to the Internet, for fast easy access. Just write their first name, a period (or 'dot'), surname @hoganas.com – but leave out the dots over the 'a' and 'o' (ä, å, ö).

Some examples:
 hans.soderhjelm@hoganas.com
 per.engdahl@hoganas.com
 michael.bockstiegel@hoganas.com

Benefiting from computer technology

Computer technology is here to stay and, at Höganäs, we are doing our best to put it to full and beneficial use. It is already a vital part of our production and QA system.

Now it is time to let its potential benefit Höganäs customers directly. Correct and comprehensive product information is an invaluable tool for both ourselves and our customers. So it is only natural that we have taken a big step into modern information technology. It will make us more available to you. And, above all, we hope that it will make metal powders a more meaningful part of your production.

WELCOME TO THE INFORMATION AGE

We aim to make it easy for the customer to identify the best solution for their particular application.

The Höganäs Iron Powder Information Hub (HIPIH) is an interactive tool for Höganäs customers. Containing over 600 megabytes of information in the form of text, sound- and film clips, and illustrations, it is distributed on a CD-ROM.

Modern computer technology lets us present comprehensive information about Höganäs products and their applications in a concise and highly illustrative format. By making all this information instantly and easily accessible to the customer, we can respond rapidly and effectively to customer enquiries.

EASILY ACCESSIBLE

HIPIH makes it more interesting to do business with Höganäs. It also makes it possible for the user to easily find the details he or she needs amongst large volumes of information.

HIPIH is organized as follows:

Company, where the Höganäs sales organization is presented, together with marketing- and product development personnel. This section also contains about 10 minutes of excerpts from the Höganäs Jubilee film.

Product, containing information about all Höganäs products, presented in the form of product data sheets, tables, diagrams and electron micrograph photos. The section's database for sintered properties also lets the user define the interesting parameters and then

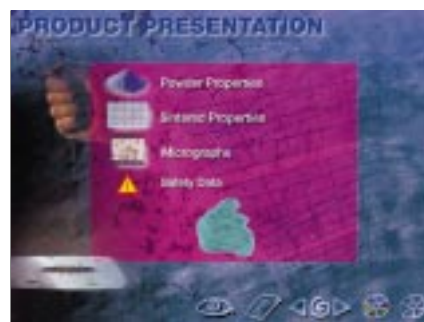
run a search. Information is subsequently presented in the form of a diagram which illustrates the chosen characteristics.

CASIP, which stands for Computer Aided Selection of Iron Powder. Working from the demands placed on the end product, the well-known Höganäs CASIP program helps the customer to select the right powder quality for his use.

Technical Reference Library, a collection of more than 100 articles and presentations, indexed and searchable by word or phrase.

PM School, an interactive version of the Höganäs Handbook for Sintered Components, where you can learn all about the advantages of the P/M technique. It also serves as a 'correspondence' version of the courses available at the Höganäs PM School. When successfully completed, it will even issue you a diploma. And it is an excellent database for all types of questions in the field of Powder Metallurgy.

Have you received Höganäs HIPIH? If not, please let us know. We will send you a copy free of charge.



SYSTEM REQUIREMENTS:

Windows

80486 or better (Pentium recommended)
16 Mb RAM or more
Windows 3.1 or Windows 95/NT (Windows 95 recommended)
QuickTime 2.1 or higher
8-bit Color Monitor, 640 x 480 pixels (16 bit recommended)
4x Speed CD-ROM, or faster

Macintosh

68040 or better (PowerPC recommended)
16 Mb RAM or more
System 7.1 or higher
QuickTime 2.1 or higher
8-bit Color Monitor, 640 x 480 pixels (16 bit recommended)
4x Speed CD-ROM or faster

