



## GROWING A GLOBAL FAMILY

So much of today's growth in the use of metal powders is stimulated by development work with and for the customer.

The global Höganäs family is growing rapidly, both in size and geographical diversity. It is held together by the ambition fulfilling our business vision: to enable customers to improve their businesses by reducing costs and improving final product quality.

High levels of know-how and teamwork are essential to Höganäs. So is firm commitment to independence; it is the only way we can continue to ensure all customers a development partner who serves their best interests. Increasing use of our metal powders shows that we're on the right track.

That's why our plant expansion and quality goals are ambitious: we're now producing in seven countries, and will increase output by 50% over the next 18 months. Equally ambitious are our customer support plans, which aim to instantly place comprehensive service and know-how at the disposal of users around the world.

Please accept our apologies for the late arrival of this issue of Powder News. The global Höganäs family just won't stop growing, but now it's time to stop and tell you about it. Enjoy your reading!

Sincerely,

Claes Lindqvist

## To build an independent future

By Autumn 2001, Höganäs production capacity around the world will have effectively increased by about 50 percent.

Despite the short time frame, this extraordinary growth will be achieved on schedule. Well-founded plans and a highly capable pool of human resources make it possible.



by Sten-Åke Kvist

Our plans build on the recognition that the market needs an independent metal powder supplier capable of global delivery, support and service. Changes in the market are bringing them to fulfillment.

### Half the world's consumption

In early Spring 1999, Höganäs was effectively freed to deal directly with metal powder customers in the Americas.

It quickly became clear that potential demand required more than just an extension

of our supply lines. Therefore, we immediately initiated a search for potential

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Astloy CrM parts at Stadler, S.A.

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► domestic production capacity on both American continents.

**HÖGANÄS BRASIL**

São Paulo-based Belgo Brasileira was the first recruit.



Formally absorbed in July '99, when it became a wholly-owned Höganäs subsidiary, it gives us a well-established production base for atomized iron and aluminum powders. The new company will soon be able to offer local P/M producers world-class metal powder production and mixing technologies. The PTECH '99 meeting, highlighted in the accompanying article, shows that the South American market is ready!

Nor have we been idle in North America. This market alone represents nearly half the world's metal powder consumption. Helping meet its needs is a challenge we look forward to. Parallel with our establishment in Bethlehem, Pennsylvania (see page 4) we scouted potential production resources.

As of this writing, we've made two major investments that will enable us to begin delivery of US-made metal powders within one year. Once integration work is completed (currently estimated at early Autumn 2001), production capacity will be more than 100,000 tons per year of atomized iron and 20,000 tons per year of sponge iron powder.

**FIRST MISS STEEL**

In January this year, Höganäs AB signed an agreement with ChemFirst, Inc. to purchase FirstMiss Steel at Hollsopple, Pennsylvania. With a complete modern infrastructure for manufacture of high-alloy steel – including



50-ton EAF-, AOD-, ladle- and vacuum degassing furnaces – the mill will convert over the coming year to production of atomized iron powder. Ground space totaling 800,000 m<sup>2</sup> (200 acres) provides ample room for set-up of atomizing, annealing and mixing facilities, as well as room for future expansion.

**PYRON CORPORATION**

We signed a second agreement in March, this time with Zemex Corporation, for purchase of their metal powder subsidiary, Pyron Corporation.

Pyron produces atomized iron powders for sintered component manufacture, as well as a unique sponge iron powder utilized in production of friction materials, and for other special applications. The company has a strong domestic production and marketing organization. Plant facilities at Niagara Falls, NY, are complemented by a



mixing station at St. Marys, Pennsylvania.

As Pyron is already producing at capacity for atomized powders, its expansion plans mesh well with our acquisition of FirstMiss. Developments at Hollsopple pave the way for increased output, and the possibility to further refine Pyron's product range.

In both cases, production benefits are just part of the picture; the human element is equally important. We've gained access to a healthy core of metal powder know-how, in development and production as well as marketing. Harmonization with Höganäs will create strong marketing and process synergies and gives global exposure to the Pyron sponge iron range.

**European expansion**

Metal powder demand is increasing globally, and in a range of market sectors. Our investments mirror these facts. Keeping pace with our efforts in the Americas, as well as earlier investments in Asia, expansion is currently under way in Belgium and Sweden as well.

**HÖGANÄS BELGIUM**

Initiated last August, expansion at Höganäs

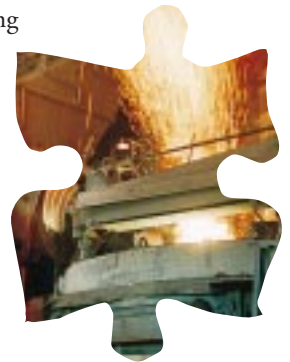
Belgium will be ready by Autumn this year.

Installation of a new induction furnace, plus atomizing and packing facilities, raises the plant's atomized powder capacity by 300%, offering production efficiency and quality benefits. The additional capacity will boost supply of stainless steel and other high-alloy powders to the P/M sector in particular.



**HALMSTAD & HÖGANÄS**

At the atomizing plant at Halmstad, a second line will be on-stream this Autumn, through installation of a 50-ton ladle furnace as well as a new water atomizing line. The investment, which aims to secure supply of pre-alloyed powder, will ensure cost-efficient production of very clean atomized iron powder.



To serve the expansion, mixing capacity at the Distalloy plant in Höganäs is also being expanded.

**Human resources**

Our expansion plans call for high know-how levels, in particular from the core group responsible for accomplishing them.

While certain objectives will utilize external expertise, we are able to fill the majority of core assignments from our own highly qualified resource pool – both at Höganäs and its new subsidiaries.

To strengthen our independent future, we shall continue to exercise the human resource philosophy which makes Höganäs the world leader in metal powder: that dedicated personnel are motivated by respect for competence and commitment, and stimulated by the opportunity to enhance their own expertise as well as the strength of their team.

# PTECH 99

## – a great start for Höganäs Brasil Ltda

The breathtaking Iguazu Falls, on the shared border of Brazil, Argentina and Paraguay, was the backdrop last November for the 2nd International Latin-American Conference in Powder Technology, PTECH'99.

Despite this natural splendor, the conference was a working meeting, a venue for three days of meetings, presentations and exhibitions. Attendees came from most Latin American countries as well as North America and Europe. Höganäs and Höganäs Brasil were well represented.

### A busy three days

The conference's organizing committee, including Francisco Ambrozio Filho, Lucio Salgado, Mr. Tsakiroopoulos and Cristina Marcucci, deserve applause for fitting so many interesting presentations into the meeting's three days. With an actual attendance of no less than 300 participants, the meeting was very well organized. It will attract even larger numbers in the year 2000.

Nearly two hundred papers were presented, making this the largest Latin American conference on powder technology. Among the general sessions, technical lectures, oral and poster sessions, topics included Powder Production and Compacting, Sintering and Mechanical Properties, Processing and Heat Treatment, Metal Injection Noduling, Mechanical Alloying and, not least, P/M applications.

The meeting also gave Höganäs an excellent opportunity to introduce its new role in the Latin American market. In a brief one-hour presentation at the opening session, Hans Söderhjelm, Sten-Åke Kvist and Gilles Gachot introduced the company, its acquisition of Belgo Brasileira, and the benefits which the new company (Höganäs Brasil Ltda.) will be able to deliver to the South American market. Ulf Engström then reviewed new P/M developments. His sub-

sequent technical presentation, titled "High-Density Sintered Steels for High-Performance Applications", was very well received.

### Höganäs dinner

In our eyes, no P/M conference would be complete without a Höganäs party, and PTECH'99 was an excellent opportunity to try a new variation.

In addition to hosting the conference's Welcome dinner, attended by 200 participants, Höganäs also put on a 'traditional' Höganäs evening. The Höganäs festivities



Venue of the Höganäs evening.

were held at the Casino Iguazú, on the Argentinean side of the falls. In addition to learning tango from real professionals, attendees were able to try their luck at the tables. At last word, no major gaming losses were reported.

We look forward with anticipation to PTECH 2000!



Beautiful scenery at the Iguassu Falls.

It's almost six months since North American Höganäs formally inaugurated its new offices and Tech Center facilities at Bethlehem, Pennsylvania. The company's CEO, Ulf Holmqvist, who presided over the festivities, said proudly "Höganäs is here to stay!"

## REPORT FROM:

# North American Höganäs

The seventy guests attending the ceremony listened to speeches by Claes Lindqvist, President of Höganäs AB, and several local and regional dignitaries. Following a champagne lunch and technical presentations, a tour of the office and Tech Center showed visitors that Höganäs has backed its North American establishment with the facilities to deliver product, know-how and service.

### Technology promotes understanding

Development commitment and technical service have helped to put Höganäs in the vanguard of the world's metal powder suppliers, and the company spared no expense to make sure that the US and Canadian markets get on-the-spot support.

Hans Söderhjelm, Sales Manager for P/M powders explains: "Höganäs is leading the way by using multimedia technology to give customers faster, more effective service and support!" The Tech Center tour highlighted this point through an e-meeting with the laboratory in Sweden. Höganäs's audio-visual hook-ups, now functional in Sweden, France and the US, enable users to exchange



Owe Mårs face-to-face with the lab in Sweden.

ideas and both written and visual information in real time, regardless of location.

Owe Mårs, who heads the Tech Center, says: "Customers here are welcoming this kind of support which is one of Höganäs's greatest strengths. The video hook-up and full access to the Höganäs Extranet, puts all of Höganäs's know-how resources at the customer's disposal." The center now has its own press, furnace, and a mixing station for trial batches as well, so Owe and his team of engineers can provide direct local development support to customers, too.

4-wheel drives in a big way. Lots of new technology is being developed, and statistics show that the market is growing at a rate of about 6%. "We've got the resources and know-how to support this growth and expand our own market share without crowding our competition", continues Ulf Holmqvist. In addition to this, the acquisitions of First Miss Steel and Pyron will make us even more competitive on the market.

### Ambitious plans

"North America represents half the global metal powder market, and we see great potential here", says Ulf Holmqvist. US auto makers are into SUV's and



Höganäs CEO Claes Lindqvist in discussion with Peter Johnson.

# NIP15 – window on the future

The Society for Imaging Science & Technology held its 15<sup>th</sup> annual NIP conference in Orlando, Florida, last October. Höganäs representatives were very active at the exhibition, with a comprehensive range of environment-friendly Carrier Core powders.

NIP (Non-Impact Printing) is a modest name for a technology that makes life a little easier for practically everyone in the developed world. Black & white photocopiers, ink-jet and laser printers, and many of the world's fax machines use NIP technology, and color printers and copiers have begun to follow suit.

## An expanding technology

Though NIP is a 'mature' technology, its use is growing geometrically, thanks to external causes and innovation in the industry.

The internet and affordable computers have lowered barriers to information access, and both business and private consumers have taken advantage. Developers have quickly improved the technology, and now offer near-photographic results – even on inexpensive ink-jet printers.

On the commercial side (with the exception of magazine publications), laser 'Print



Lars Hultman, Per Engdahl and Mr Kameyama represented Höganäs.

On Demand' is becoming the norm today, particularly because of its logistical benefits. Advanced digital printing offers high speed and excellent resolution, not only on paper but also on fabric, metals and plastics, thus opening further application possibilities.

## Conference as catalyst

The NIP conference showcases the latest developments in non-impact and digital printing. This year's show was attended by over 80 delegates, from both industry and academia. The comprehensive 5-day program informed attendees of issues, emerging trends, technologies and materials, while poster sessions permitted a more in-

formal and direct opportunity for authors to communicate their message to interested visitors.

Close to 50 companies participated in the exhibition. Many, like Höganäs, were vendors to the electrophotographic industry. The Höganäs Carrier Core range was very well received, as was the company's 'hospitality' gift – a classic ashwood yo-yo, digitally printed (of course) with the company and product logos.

NIP16 will be held in October at the Westin Bayshore, Vancouver. Attendance is already projected at over 1000 visitors, with a program of activities to match. Höganäs will be there in force.

## Höganäs Chair in Powder Metallurgy

The Höganäs Chair in Powder Metallurgy was established a year ago at three leading European universities, Universidad Carlos III de Madrid, Università di Trento and Vienna University of Technology.

During the past year, the dedicated work of the three Ph.D students has led to many

interesting research results, including the sintering behavior of Astaloy CrM, heat and surface treatment of this material, and comparison of the prealloyed and mixed Fe-Cr-Mo systems.

In addition to research at each university, the Höganäs Chair also sponsored a P/M School held in Madrid in July, and a seminar on Sintering Atmospheres in Austria in September.

## Activities in 2000

In April 2000, a P/M seminar will be held at Trento, Italy, sponsored by the Höganäs

Chair at Università di Trento. The seminar focuses on Surface Engineering of P/M Steels, with emphasis on fatigue, wear, corrosion, anti-corrosion coatings, carburisation, induction hardening, nitriding and steam treatment. Lecturers will include professors from the participating universities, as well as senior researchers from the P/M industry.



Late last year, the Höganäs Gas Atomized Powder and Specialty Powder business areas became the Coldstream Division.

For customers, however, it's business as usual. Höganäs's business has always proceeded on several fronts simultaneously. So what does the name change mean?

# Coldstream: Höganäs High-Alloy Division

Coldstream's mandate is to develop, produce and deliver high-alloy powders that ensure high added value, including application know-how. The goal of development is to offer powder alternatives which give the customer the lowest total cost.

## Growing application range

Where its predecessors focused particularly on thermal surfacing, Coldstream has broadened its horizons. Proven benefits have been identified in P/M, filtering, welding and brazing applications, and all of these areas are being vigorously pursued. Development is key. Coldstream places high value on collaboration with competent partners, to create growth in new market areas.

Stainless steel automotive exhaust components are an excellent example. Here, durability requirements specify better corrosion resistance. The P/M process enables production of high-alloy components such



Coldstream Division's plant in Belgium.

as exhaust coupling flanges and oxygen sensor bosses that offer cost and performance advantages over traditional production techniques. Several components are already in production, and the range is expanding steadily.

Coldstream's thermal surfacing goals are to provide improved performance on metal surfaces subjected to extreme or continuous exposure. Focus in recent years has been on processes such as PTA, SWP and laser cladding, where Coldstream developments have shown that quality and accuracy benefits can be won at the same time an extremely high level of automation is achieved.

## Powder, process and potential

Gas atomization, water atomization or micronization? Which process is used? Quite simply, it depends on the end use. Production is always based on the most suit-

able process for achieving desired performance characteristics.

Production resources have been steadily expanded in all areas to meet demand, both current and potential. High-alloy metals offer value-added performance, and it is Coldstream's goal to provide producers with the market's best selection of powder choices.

# Stadler, S.A. now making Astaloy CrM parts

Stadler, S.A., one of Spain's leading P/M producers, has developed and produced metal components to customer specifications since 1969. Their state-of-the-art plant serves the European automotive industry, as well as a range of other sectors.

Sintering of metal powder is the most modern and advanced method of metal transformation. ISO 9002-certified Stadler has always been quick to put the latest innovations to work on its customers' behalf. The company was one of the first to investigate the potential of Astaloy CrM.

Today, Stadler have several Astaloy

CrM transmission parts in production and several more in the final stages of approval. Their tough approval process stimulated the decision to move ahead with Astaloy CrM, which gave a wear resistance 20% better than a Fe, Ni, Cu, and Mo alloyed powder.

The development process has been very

short, and production started in December, with parts sintered in cracked ammonia at 1120°C. Initial production is in small series, with a gradual growth planned through the year 2000.

Stadler's Astaloy CrM gears have diameters from 42 to 50 mm, and weights from 45 to 103 gr.



Astaloy CrM part designed for the automotive industry.

## Coldstream offers brazing range

Brazing enables metal parts to be metallurgically bonded, using a hard solder with a high melting point. The technique has been used for nearly 3,000 years – artifacts on display in China show that our distant ancestors utilized both brazing and welding.

Today, however, rapid advances in process technology and filler metal developments make high-temperature brazing an important complement to welding – especially in application areas such as fuel cells and medical devices.

Coldstream has been involved in brazing developments since 1982, recently achieving authorized supplier status with

two major industry forces. Coldstream's new brazing program was launched at the International Brazing and Soldering Conference in April.

High-temperature brazing offers benefits beyond cost efficiency: it is often preferable to welding, as it enables tighter control of temperature and greater flexibility in the type and number of joins to be made.

Brazed coating technology has advanced rapidly in the last two decades. Depending on wear characteristics and desired wear protection, brazing permits coatings from the micron level up to more than twenty millimeters' thickness. High temperature-, abrasion- and corrosion-resistance can be achieved for applications including pump housings, extruder parts, pneumatic cylinders and grinding pins. Ongoing developments will optimize coating compositions and increase the range of coating and substrate materials.

## P/M seminars in Mexico



Mexican P/M seminars were held on October 26 & 27, 1999.

In total, 40 attendees came to the two meetings, held at Sintermetal,

S.A. and Sinterstahl Mexico. Presentations included a comprehensive overview of powder production, and powder grades and their applications, as well as an introduction to the various services provided by Höganäs. At both sites, the presentations, held in Spanish, generated plenty of questions and discussion.

Activities for the Mexican market in the year 2000 will include a week-long Spanish language P/M School at the Höganäs facilities in Sweden, scheduled to take place in late Spring or early Autumn. If you're interested in attending, please contact your Höganäs representative.

## POWDER PEOPLE

Höganäs's service and support – its interface with customers – is a core ingredient in our success. No fewer than eleven new recruits have 'come aboard' in the last six months – six in Sweden and five in the US.



**OLOF ANDERSSON**

With a Master of Science in Mechanical Engineering from the University of Lund, and 4 years as a development engineer with Sandvik Coromant, Olof

joins Höganäs R&D to bolster our applications development capabilities.



**CARINA BERGKVIST**

Carina is a development engineer in our production department. She served previously as a quality engineer at the Barsebäck nuclear power plant, and has

a Master of Science in Mechanical Engineering from the University of Lund.



**SENAD DIZDAR**

Senad, who recently gave his doctoral thesis in tribological mechanics at the Swedish Royal Institute of Technology, will serve as an applications development engineer at the R&D department.



**MARTIN HOLMQVIST**

After gaining a Bachelor of Science in Business Administration and Engineering at the University of Kristianstad, Martin joins the P/M marketing department. As sales controller, he provides the department with comprehensive data on which to base planning decisions.



**JIM HÄGGLUND**

Jim is no stranger to Höganäs. He has worked here at regular intervals during his university training, which he completed last Autumn at Luleå University of

Technology, with a Master of Science in

Process Metallurgy. At Höganäs, he now serves as an engineer in our production development section.



**FREDRIK PERSSON**

Fredrik holds a Master of Science in Materials Technology from the Swedish Royal Institute of Technology, and has served with Sandvik Steel in Sandviken. At Höganäs, he is now working with process development at our R&D department.



**ANGEL FUENTES**

Backed by training in hydraulics and electronics, Angel has fifteen years technical experience in mechanical drafting and design, where he was involved in the building and testing of prototype presses. Recent background includes the building of precision OEM machinery for the powder metal industry. He is now serving as a technician at the North American Höganäs Tech Center.

**PETER HANSEN**

Peter joins us after 12 years service in the P/M industry as a product development and field engineering manager, most recently at CI Hayes. He graduated from the University of Western Ontario in 1988 with a B.E.S. in Materials Engineering. At North American Höganäs, he will serve as an Account Manager.



**ALAIN MARCOTTE**

Joins North American Höganäs as an Account Manager. With a Masters in Metallurgical Engineering from Laval University in Canada, Alain served first as a metallurgist at

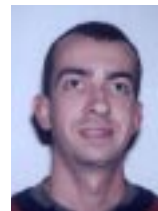
Hydro-Quebec Research Institute, where he worked on development of P/M electric motors, and then technical manager at US Bronze Powders and Zinc Corporation, before coming to Höganäs.



**DAVID MILLIGAN**

Graduated Penn State University with a Bachelor of Science in Mechanical Engineering Technology. After seven years in the P/M industry – five at

Symmco and two at Windfall, in parts manufacturing – and two years at AMP in electrical connector manufacturing, he joins the North American Tech Center as an engineer.



**JOHN MCLELLAND**

Received his Bachelor of Science in Materials Science and Engineering in 1997 from Lehigh University in Bethlehem. He worked briefly as a materials engineer and in the US aerospace industry, designing seals and components, before joining the North American Tech Center as an engineer.

### Upcoming shows

The Höganäs show calendar is listed below. Specific details and latest show updates are available on our website.

**Electrophotographic:**  
IS&T NIP 16, October 15–20,  
Vancouver, BC, Canada

**P/M:**  
PM2TEC, May 30–June 3,  
New York, NY, USA  
PM2000, November 12–16,  
Kyoto, Japan

**Soft Magnetic Composites:**  
MOTORTECH, April 19–21,  
Tokyo, Japan

# Höganäs

THE DIFFERENCE IS KNOWLEDGE

Published by Höganäs AB  
S-263 83 HÖGANÄS, Sweden  
Tel: + 46 (42) 33 80 00  
Fax: +46 (42)33 81 50  
www.hoganas.com

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